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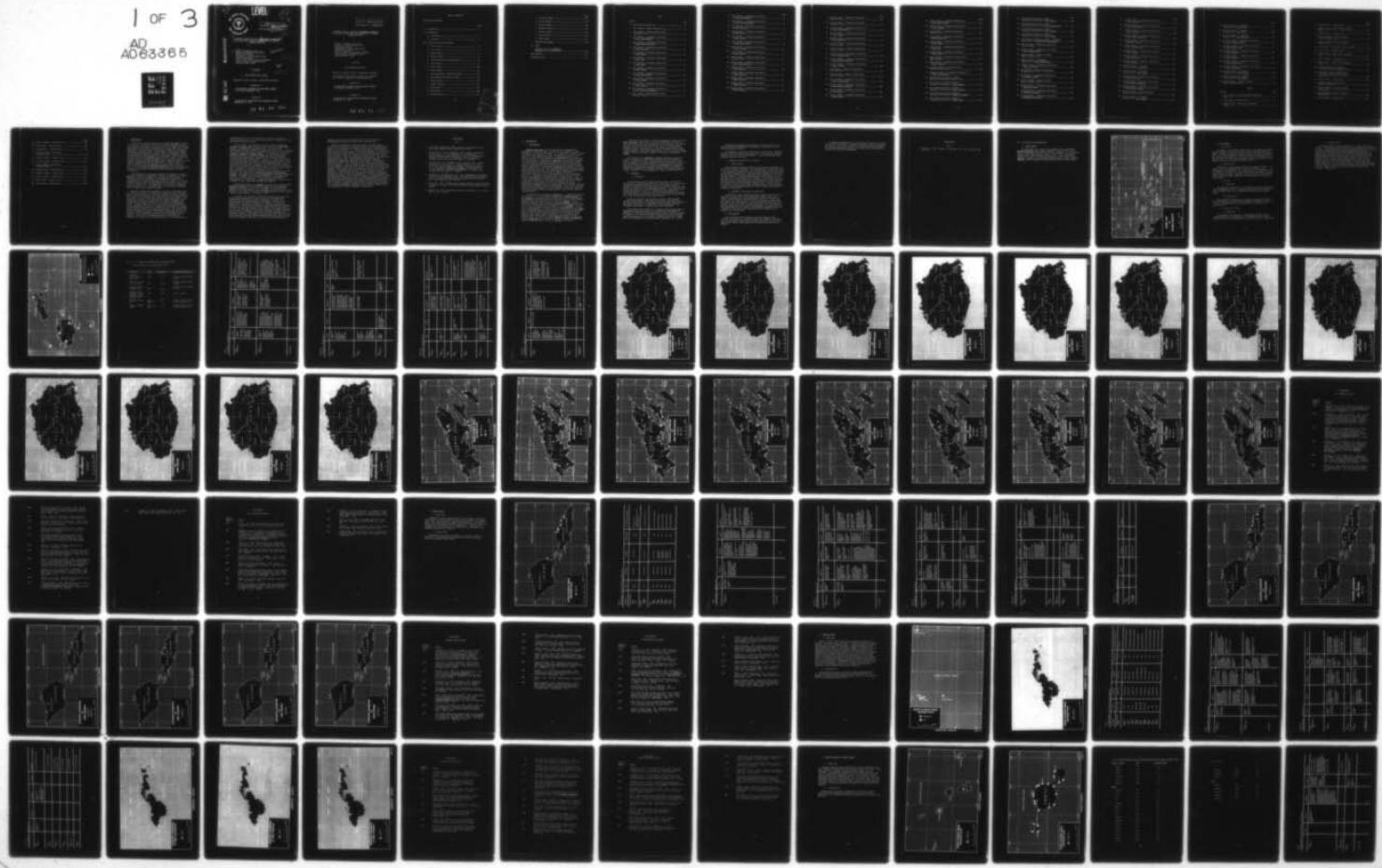
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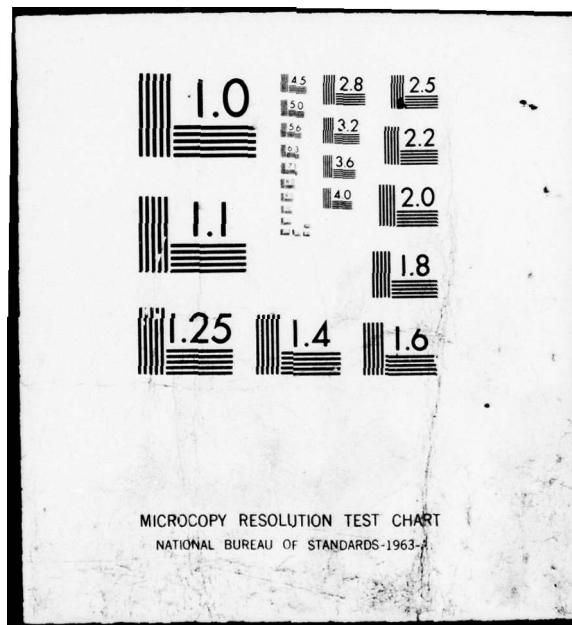
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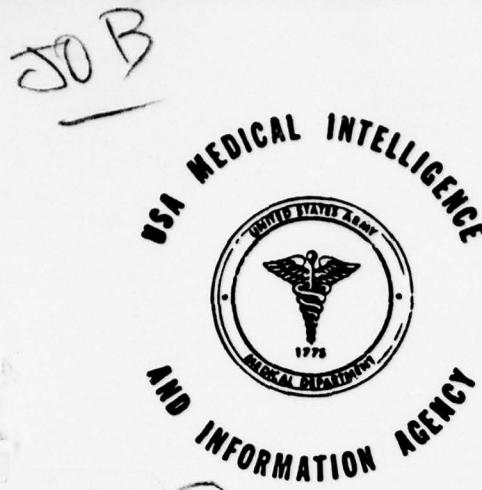
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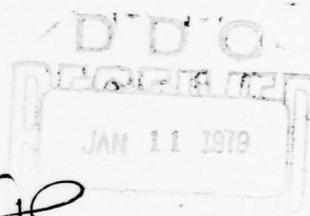
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9 A BIOMETRIC STUDY OF FILARIASIS (WUCHERERIA BANCROFTI)
IN THE SOUTH PACIFIC AREA FOR APPLICATION TO A DISEASE
FORECASTING SYSTEM.

10 Robert S. Desowitz, Ph.D., D.Sc.
Professor of Tropical Medicine and
Medical Microbiology
Department of Tropical Medicine and
Medical Microbiology
School of Medicine, University of Hawaii
Leahi Hospital, 3675 Kilauea Avenue
Honolulu, Hawaii 96816

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11 June 1976

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9 Final Comprehensive Report

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Prepared for

US ARMY MEDICAL RESEARCH AND DEVELOPMENT COMMAND
FORT DETRICK, MARYLAND 21701

Prepared by

US ARMY MEDICAL INTELLIGENCE AND INFORMATION AGENCY
WASHINGTON, DC 20314

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Leahi Hospital, 3675 Kilauea Avenue
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The findings in this report are not to be construed
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TABLE OF CONTENTS

Maps Tables and Graphs

	Page
I. Introduction	1
II. Epidemiology	
A. Introduction	5
B. Procedure	6
III. Descriptive Area Epidemiology	
A. South Pacific	11
B. Fiji Islands	13
C. Western Samoa	47
D. American Samoa	65
E. French Polynesia: Society Islands	79
F. Cook Islands	94
G. Ellice Islands	102
H. Tonga Islands	114
I. French Polynesia: Marquesas Islands	129
J. New Caledonia and Loyalty Islands	136
K. Wallis Islands	151
L. Tokelau Islands	157
M. Niue Island	164
N. New Hebrides	168
O. Solomon Islands	176



	Page
P. Caroline Islands	202
Q. Tubuai Islands	220
R. Mariana Islands	224
S. Marshall Islands	232
T. Gilbert Islands	236
U. Nauru Island	240
V. Ocean Island	244
Selected Bibliography	248
 IV. Index	
Mosquito Vectors of <u>Wuchereria</u> <u>bancrofti</u> in the South Pacific	262
Data Handling	269
Distribution List	271

MAPS

Map No.	Page
1. South Pacific Endemic Area	12
2. Fiji Islands -- Human Prevalence Data	15
3. Fiji Islands -- Highest Recorded Human Prevalence Rates	21
4. Fiji Islands -- Geographic Distribution of <u>Aedes polynesiensis</u>	22
5. Fiji Islands -- Geographic Distribution of <u>Aedes pseudoscutellaris</u>	23
6. Fiji Islands -- Geographic Distribution of <u>Aedes fijiensis</u>	24
7. Fiji Islands -- Geographic Distribution of <u>Aedes aegypti</u>	25
8. Fiji Islands -- Geographic Distribution of <u>Aedes suvae</u>	26
9. Fiji Islands -- Geographic Distribution of <u>Aedes vexans</u>	27
10. Fiji Islands -- Geographic Distribution of <u>Aedes vigilax</u>	28
11. Fiji Islands -- Geographic Distribution of <u>Culex annulirostris</u>	29
12. Fiji Islands -- Geographic Distribution of <u>Culex fatigans</u>	30
13. Fiji Islands -- Geographic Distribution of <u>Culex sitiens</u>	31
14. Fiji Islands -- Geographic Distribution of <u>Taeniorhynchus purpurata</u>	32
15. Fiji Islands -- Highest Recorded Human Prevalence Rates	33

	Page
16. Fiji Islands -- Geographic Distribution of <u>Aedes polynesiensis</u>	34
17. Fiji Islands -- Geographic Distribution of <u>Aedes pseudoscutellaris</u>	35
18. Fiji Islands -- Geographic Distribution of <u>Aedes fijiensis</u>	36
19. Fiji Islands -- Geographic Distribution of <u>Aedes vexans</u>	37
20. Fiji Islands -- Geographic Distribution of <u>Aedes vigilax</u>	38
21. Fiji Islands -- Geographic Distribution of <u>Culex annulirostris</u>	39
22. Fiji Islands -- Geographic Distribution of <u>Culex fatigans</u>	40
23. Fiji Islands -- Geographic Distribution of <u>Culex sitiens</u>	41
24. Western Samoa -- Highest Recorded Human Prevalence Rates	48
25. Western Samoa -- Geographic Distribution of <u>Aedes polynesiensis</u>	55
26. Western Samoa -- Geographic Distribution of <u>Aedes samoanus</u>	56
27. Western Samoa -- Geographic Distribution of <u>Aedes upolensis</u>	57
28. Western Samoa -- Geographic Distribution of <u>Aedes oceanicus</u>	58
29. Western Samoa -- Geographic Distribution of <u>Aedes tutuilae</u>	59
30. Western Samoa -- Geographic Distribution of <u>Culex fatigans</u>	60

	Page
31. American Samoa -- Highest Recorded Human Prevalence Rates	66
32. American Samoa -- Highest Recorded Human Prevalence Rates	67
33. American Samoa -- Geographic Distribution of <u>Aedes polynesiensis</u>	72
34. American Samoa -- Geographic Distribution of <u>Aedes samoanus</u>	73
35. American Samoa -- Geographic Distribution of <u>Aedes upolensis</u>	74
36. Society Islands -- Highest Recorded Human Prevalence Rates	80
37. Society Islands -- Highest Recorded Human Prevalence Rates	81
38. Society Islands -- Geographic Distribution of <u>Aedes polynesiensis</u>	86
39. Society Islands -- Geographic Distribution of <u>Aedes pseudoscutellaris</u>	87
40. Society Islands -- Geographic Distribution of <u>Culex fatigans</u>	88
41. Cook Islands -- Highest Recorded Human Prevalence Rates	95
42. Ellice Islands -- Highest Recorded Human Prevalence Rates	103
43. Ellice Islands -- Geographic Distribution of <u>Aedes polynesiensis</u>	106
44. Ellice Islands -- Geographic Distribution of <u>Aedes pseudoscutellaris</u>	107
45. Ellice Islands -- Geographic Distribution of <u>Aedes aegypti</u>	108
46. Ellice Islands -- Geographic Distribution of <u>Aedes vigilax</u>	109

	Page
47. Ellice Islands -- Geographic Distribution of <u>Culex annulirostris</u>	110
48. Ellice Islands -- Geographic Distribution of <u>Culex fatigans</u>	111
49. Tonga Islands -- Highest Recorded Human Prevalence Rates	115
50. Tonga Islands -- Geographic Distribution of <u>Aedes scutellaris</u>	121
51. Tonga Islands -- Geographic Distribution of <u>Aedes tongae</u>	122
52. Tonga Islands -- Geographic Distribution of <u>Aedes tabu</u>	123
53. Tonga Islands -- Geographic Distribution of <u>Aedes finlaya</u>	124
54. Tonga Islands -- Geographic Distribution of <u>Aedes nocturnus</u>	125
55. Tonga Islands -- Geographic Distribution of <u>Aedes oceanicus</u>	126
56. Marquesas Islands -- Highest Recorded Human Prevalence Rates	130
57. Marquesas Islands -- Geographic Distribution of <u>Aedes polynesiensis</u>	133
58. New Caledonia and Loyalty Islands -- Highest Recorded Human Prevalence Rates	137
59. New Caledonia and Loyalty Islands -- Geographic Distribution of <u>Aedes aegypti</u>	140
60. New Caledonia and Loyalty Islands -- Geographic Distribution of <u>Aedes alternas</u>	141
61. New Caledonia and Loyalty Islands -- Geographic Distribution of <u>Aedes notoscriptus</u>	142
62. New Caledonia and Loyalty Islands -- Geographic Distribution of <u>Aedes vexans</u>	143

	Page
63. New Caledonia and Loyalty Islands -- Geographic Distribution of <u>Aedes vigilax</u>	144
64. New Caledonia and Loyalty Islands -- Geographic Distribution of <u>Culex annulirostris</u>	145
65. New Caledonia and Loyalty Islands -- Geographic Distribution of <u>Culex fatigans</u>	146
66. New Caledonia and Loyalty Islands -- Geographic Distribution of <u>Culex sitiens</u>	147
67. New Caledonia and Loyalty Islands -- Geographic Distribution of <u>Taeniorhynchus xanthogaster</u>	148
68. Wallis Islands -- Highest Recorded Human Prevalence Rates	152
69. Wallis Islands -- Geographic Distribution of <u>Aedes polynesiensis</u>	154
70. Takelau Islands -- Highest Recorded Human Prevalence Rates	158
71. Tokelau Islands -- Geographic Disbribution of <u>Aedes polynesiensis</u>	160
72. Tokelau Islands -- Geographic Distribution of <u>Aedes scutellaris</u>	161
73. New Hebrides -- Highest Recorded Human Prevalence Rates	169
74. New Hebrides -- Geographic Distribution of <u>Anopheles farauti</u>	173
75. Solomon Islands -- Highest Recorded Human Prevalence Rates	177
76. Solomon Islands -- Geographic Distribution of <u>Anopheles farauti</u>	183
77. Solomon Islands -- Geographic Distribution of <u>Anopheles koliensis</u>	184
78. Solomon Islands -- Geographic Distribution of <u>Anopheles punctulatus</u>	185

	Page
79. Solomon Island -- Geographic Distribution of <u>Aedes albilibris</u>	186
80. Solomon Islands -- Geographic Distribution of <u>Aedes albolineatus</u>	187
81. Solomon Islands -- Geographic Distribution of <u>Aedes imprimens</u>	188
82. Solomon Islands -- Geographic Distribution of <u>Aedes quasiscutellaris</u>	189
83. Solomon Islands -- Geographic Distribution of <u>Armigeres breinli</u>	190
84. Solomon Islands -- Geographic Distribution of <u>Culex annulirostris</u>	191
85. Solomon Islands -- Geographic Distribution of <u>Culex fatigans</u>	192
86. Solomon Islands -- Geographic Distribution of <u>Culex fraudatrix</u>	193
87. Solomon Islands -- Geographic Distribution of <u>Culex halifaxi</u>	194
88. Solomon Islands -- Geographic Distribution of <u>Culex hilli</u>	195
89. Solomon Islands -- Geographic Distribution of <u>Culex sitiens</u>	196
90. Solomon Islands -- Geographic Distribution of <u>Mansonia uniformis</u>	197
91. Solomon Islands -- Geographic Distribution of <u>Tripteroides quasiornata</u>	198
92. Solomon Islands -- Geographic Distribution of <u>Tripteroides solomonis</u>	199
93. Caroline Islands -- Highest Recorded Human Prevalence Rates	203
94. Caroline Islands -- Geographic Distribution of <u>Aedes aegypti</u>	206

	Page
95. Caroline Islands -- Geographic Distribution of <u>Aedes hemili</u>	207
96. Caroline Islands -- Geographic Distribution of <u>Aedes kochi</u>	208
97. Caroline Islands -- Geographic Distribution of <u>Aedes moenensis</u>	209
98. Caroline Islands -- Geographic Distribution of <u>Aedes pseudoscutellaris</u>	210
99. Caroline Islands -- Geographic Distribution of <u>Aedes scutoscriptus</u>	211
100. Caroline Islands -- Geographic Distribution of <u>Aedes zonatipes</u>	212
101. Caroline Islands -- Geographic Distribution of <u>Aedes zonatpeg</u>	213
102. Caroline Islands -- Geographic Distribution of <u>Culex annulirostris</u>	214
103. Caroline Islands -- Geographic Distribution of <u>Culex carolinensis</u>	215
104. Caroline Islands -- Geographic Distribution of <u>Culex fatigans</u>	216
105. Caroline Islands -- Geographic Distribution of <u>Culex pullus</u>	217
106. Tubuai Islands -- Highest Recorded Human Prevalence Rates	221

TABLES

Table No.	Page
1. Fiji Islands -- Most Recent Human Prevalence Rates	16
2. Fiji Islands -- Mosquito Data	17
3. Western Samoa -- Most Recent Prevalence Rates	49

	Page
4. Western Samoa -- Mosquito Data	50
5. American Samoa -- Most Recent Prevalence Rates	68
6. American Samoa -- Mosquito Data	69
7. French Polynesia: Society Islands -- Recent Prevalence Rates	82
8. French Polynesia: Society Islands -- Mosquito Data	84
9. Cook Islands -- Prevalence Rates, June 1969	96
10. Cook Islands -- Mosquito Data	97
11. Ellice Islands -- Most Recent Prevalence Rates	104
12. Ellice Islands -- Mosquito Data	105
13. Tonga Islands -- Most Recent Prevalence Rates	116
13A. Microfilaria Rates and Densities of Te'ekiu Villagers, Tongatapu, Tonga	117
13B. Microfilaria Rates and Densities of Villagers of Pangai Island, Ha'apai Group, Tonga	118
14. Tonga Islands -- Mosquito Data	119
15. Marquesas Islands -- Most Recent Human Prevalence Rates	131
16. French Polynesia: Marquesa Islands Mosquito Data	132
17. New Caledonia and Loyalty Islands -- Mosquito Data	138
18. Wallis Islands -- Mosquito Data	153

	Page
19. Tokelau Islands -- Mosquito Data	159
20. Niue Islands -- Mosquito Data	165
21. New Hebrides -- Mosquito Data	170
22. Solomon Islands -- Most Recent Prevalence Rates	178
23. Solomon Islands -- Mosquito Data	179
24. Caroline Islands -- Mosquito Data	204
25. Tubuai Islands -- Most Recent Prevalence Rates	222
26. Mariana Islands -- Mosquito Data	225
27. Marshall Islands -- Mosquito Data	233
28. Gilbert Islands -- Mosquito Data	237
29. Nauru Island -- Mosquito Data	241
30. Ocean Islands -- Mosquito Data	245

I. INTRODUCTION

For those who will read this report it would seem helpful to give, as a prologue, a background history of the genesis and administrative alterations of this project. The project has its origins in the informal discussions the Principal Investigator held in June, 1973, with Colonel Hinton Baker, then Director of the Division of Biometrics and Medical Information Processing, WRAIR. Colonel Baker had initiated a Disease Forecasting System which would predict, based on environmental factors, the geographic distribution of any given infectious disease as well as provide a quantitative assessment of a non-immune's risk of contracting the infection upon entering the endemic area. An example of the program's design may be given by quoting the "technical objective" of the research proposal submitted for this contract: "The aim would be to provide a quantitative risk assessment of a non-immune's risk to infection with sub-periodic Wuchereria bancrofti in the South Pacific area. It is also expected that the proposed study will contribute to the development of a general mathematical model descriptive of filarial transmission."

The methodology of the project called for a collaborative effort between the staff of the Department of Disease Information, Division of Biometrics and Medical Information Processing and the Principal Investigator and his associates. The primary responsibility of the contractee was to obtain all available literature, reports, etc. on the assigned infection within defined geographic limits and to "parse" this data on a standard form. The geographer of the Department of Disease Information was to fill in pertinent data and then all the information would be entered into a computer program.

Upon this collaborative assumption the Principal Investigator and his Research Associates, Mr. Ettl and Ms. Stansbury, began in November, 1973, to extract data from the published literature and other documents and entered the information on the form devised by Colonel Baker's group. Then, early in 1974, Colonel Baker retired from military service. The programs and contracts of the Department of Disease Information were transferred to the newly created U.S. Army Medical Intelligence and Information Agency under the direction of Lieutenant Colonel Kenneth Stuart. Colonel Stuart and I, in an exchange of correspondence and in personal meetings in June, 1974, reviewed the objectives of the Contract as they were now viewed by our new directing Agency. What emerged from these exchanges was the mutual agreement that the primary goal was to provide as complete a picture of the current epidemiological status of filariasis in the Polynesian South Pacific area (including Fiji) as possible. Construction of mathematical models to illustrate the mechanisms of transmission and risk potential was to be carried out, as

subordinate aims, only to the extent that the data and personnel resources permitted. It is within this new frame of reference that this Final Report has been written.

Why filariasis? The lymphatic filariasis caused by Wuchereria bancrofti and Brugia malayi constitutes one of the most highly endemic parasitic infections of the tropical world. The World Health Organization 1974 Expert Committee on Filariasis notes:¹ "It is estimated that at least 250 million people throughout the world are infected with Wuchereria bancrofti and Brugia malayi." This assessment is based on relatively insensitive diagnostic methods and recent epidemiologic investigations employing the considerably more sensitive membrane filtration diagnostic method² indicate that 2 to 4 times as many people are infected as formerly thought²⁻⁴. Moreover, an appreciation of the current epidemiologic status of filariasis is important since in recent years there have been major changes in the global prevalence pattern. Bancroftian filariasis in the tropical cities of the world has increased with the migration of masses of people from rural areas to urban areas.⁵ Their settlement in the cities has resulted in a process of "ghettoization" with attendant production of habitats suitable for the breeding of the main vector of Wuchereria bancrofti, Culex pipiens fatigans. For example, neither C. p. fatigans nor bancroftian filariasis occurred in Hyderabad, India in 1944, but by 1961, C. p. fatigans was plentiful in the city and there is now evidence for the local transmission of the infection. A similar phenomenon has occurred or is occurring in other cities such as Rangoon and Jakarta.

In West Africa where C. p. fatigans occurs but is not infected with Wuchereria bancrofti, there is need for vigilance because Wuchereria bancrofti is present in rural areas surrounding the cities and can undergo complete development in C. p. fatigans. In West Africa too it is probably only a matter of time before the same sequence of events, inward migration - ghettoization - filariasis, occurs.

In contrast, the situation in many parts of the South Pacific has greatly improved these past 15 years due to mass drug (Hetrazan) administration (MDA) anti-filarial campaigns. In general, the ubiquitousness and breeding habits of the mosquito vectors have not permitted vector control to be applied as a means of interrupting transmission. Mass drug administration of diethylcarbamazine (Hetrazan) appears to be an effective anti-filarial measure, but in most parts of the world the population numbers are too great and the endemic areas too vast for MDA to be applied -- particularly when the affected countries' relative poverty of finances and scarcity of medical personnel are considered. However, the islands of the Polynesia with their relatively small population, size and isolated boundaries have been ideal for anti-filarial campaigns by MDA and, in view of the altering patterns of

endemicity in this area, it was felt that a current overview of epidemiological intelligence would serve a useful purpose.

And why filariasis as a military concern? The past military significance of filariasis in the South Pacific has been summarized by Beaver.⁶ In reviewing the experience of World War II campaigns in the South Pacific, he states ". . . among the men exposed to filariasis on Samoa and certain other islands, a very high proportion up to 70% in some units acquired the infection" and "It is well documented that within a period of about 1 year, over 12,000 men acquired the infection and for the period 1942 to 1945, the estimates run much higher." Nor were these benign infections; the affected soldiers suffered retrograde lymphangitis, lymphedema, lymphadenitis and genital manifestations. Beaver also believes that there was, in many cases, an associated pulmonary disease. It is of interest that a detectable microfilaremia was not observed in these servicemen although the finding of adult worms by biopsy leaves no doubt as to the filarial etiology of these signs and symptoms. This present report is essentially concerned with filarial endemicity in indigenous populations. In these peoples filariasis presents as a wide clinical spectrum with many apparently asymptomatic individuals who have a patent microfilaremia. It should be pointed out that adult non-immunes such as military personnel or transmigrants coming from non-endemic areas seem to have a different susceptibility. These individuals frequently develop the clinical constellation associated with early pre-patent or non-patent microfilaremia that was described above. Such filariasis, therefore, deserves careful consideration in planning for the health maintenance of troops to be stationed in endemic areas or in the planning of military campaigns in these areas.

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II. EPIDEMIOLOGY

A. Introduction

Wuchereria bancrofti is a filarial parasite, transmitted by mosquitoes, in which the adult is present in the lymphatics and the microfilariae are found in the blood. It is exclusively a parasite of man and despite many attempts it has not been possible to produce a mature infection in any experimental animal. W. bancrofti exists in two "forms," divisible by the behavior of the microfilariae into "periodic" and "sub-periodic." In periodic W. bancrofti, the microfilariae exhibit a circadian rhythm, disappearing or being very much reduced in number from the peripheral vasculature during the day and then attaining peak density in this segment of the blood system at night (usually between 2200 and 0200 hours). Sub-periodic W. bancrofti microfilariae are found in the peripheral blood for all 24 hours of the day with somewhat higher peaks during the afternoon. The mechanism(s) responsible for periodicity is not known with any certainty but it probably represents an evolutionary adaptation to the feeding behavior of the local mosquito vector, i.e., periodic forms utilize night biting vectors while sub-periodic W. bancrofti are transmitted by day biting species. There is evidence that during the day the periodic microfilariae are sequestered in the small vasculature of the lungs and Hawkings¹ speculates, "The accumulation (in the lungs) is due to an active reflex by the microfilariae themselves; and it probably depends on a sideways migration through the precapillary network of arterioles. The factor in the lungs which holds up the passage of the microfilariae so that they accumulate there is the great increase in oxygen tension, which may be termed the 'oxygen barrier.'"

The distribution of periodic W. bancrofti is: Sub-Saharan tropical Africa where it is a rural disease transmitted by Anopheles gambia and An. funestus; the coastal plains of Central American and South America, particularly on the east side of the continent as well as some islands of the West Indies where the main vector is C. p. fatigans. In the Mediterranean-North African region, periodic W. bancrofti is present in small foci in Egypt where it is transmitted by C. p. fatigans and in the city of Alanya in Turkey where the vector is C. p. molestus. In Asia, periodic W. bancrofti is an urban infection transmitted by C. p. fatigans with a range from India to Ceylon through China and Japan to South East Asia and Indonesia and the Bicol Peninsula of the Philippine Islands. Endemic Pacific region areas of periodic bancroftian filariasis are Melanesia (New Guinea, Bismark Archipelago, the Solomons) and New Hebrides where the vectors are mainly Anopheles farauti, An. koliensis and An. punctulatus and in Micronesia (Mariana, Caroline, Marshall and Gilbert Islands and Nauru) were C. p. fatigans in the vector.

Sub-periodic (non-periodic, diurnal) W. bancrofti transmitted by the Aedes scutellaris group occurs in the Polynesian zone of the Pacific. This zone, which is the main geographical area considered in this report, includes Fiji, Rotuma, the Ellice Islands and all the island groups extending eastward from the latter to the Tuamotu Archipelago and the Marquesas Islands. Sub-periodic bancroftian filariasis is also present in New Caledonia and the Loyalty Islands where it is transmitted by Aedes vigilax. Periodic filariasis, endemic in Micronesia, is discussed briefly.

The variation of W. bancrofti in different geographic areas with respect to periodicity, vector and pathogenesis has led a number of workers to speculate on their taxonomic-genetic relationship. Manson-Bahr and Muggleton considered that the Polynesian sub-periodic form was a distinct variety and should be designated W. bancrofti var. pacifica. Morphometric observations on microfilariae have been carried out by Schacher and Colless and these papers should be consulted regarding the suggested designation of W. bancrofti into demes and sibling species.

B. Procedure

1. Introduction

As indicated in the introduction of this report, the Principal Investigator's responsibility under this contract was to collect, screen and analyze published articles and all other obtainable documents relating to filariasis in the Polynesian region of the Pacific and other material pertinent to the "epidemiological charge." All documents were xeroxed and forwarded to the U.S. Army Medical Intelligence and Information Agency. During July, Mr. Ettl, Research Associate, visited Fiji, Samoa and Tahiti in order to search for and photocopy unpublished data in the various medical department archives.

During the period of this contract, a total of 390 published articles were screened. From these, 160 articles, were selected as pertinent and 6032 pieces of information were extracted and entered into the computer data bank. Of these 6032 citations, 5648 related to filariasis, 384 related to diseases other than filariasis.

The information was placed in a storage/retrieval program known as FAMULUS and is presently stored in the computer at the Division of Biometrics and Data Information Processing at Walter Reed Army Institute of Research. For further information relating to the use of the data base and a description of the computer program, contact the U.S. Army Medical Intelligence and Information Agency, Washington, D.C. 20314.

Distribution and mapping of infections and vectors was done, in consultation with the Principal Investigator, by Ms. Eleanor R. Cross, Medical Geographer, USAMIIA.

The mathematical model was, essentially, the work of Mr. John Ettl, Research Associate, with the assistance of Ms. Lynn Stansbury, Research Associate, and the Principal Investigator. It will be published under separate cover at a later date.

2. Geographic Distribution of Infection

a. Human Disease

The information regarding prevalence in the various territories is based upon the reports available. The categorization of prevalence rates -- low = 0.1 to 9.9%, moderate = 10.0 to 49.9%, high = greater than 50.0% -- was deliberately made quite broad and general because the method used and the date of observation was considered only superficially. An attempt was made, however, to map the highest prevalence rates found prior to institution of control measures and treatment. This was done in order to give some idea of the potential risk of infection in the event that anti-filarial projects, where undertaken, would break down and the infection would revert to its former "natural" endemic level. It was felt that this would be the most useful form of presentation for military purposes. A narrative and tabulated description of what is known of the present situation is also given.

b. Geographic distribution of Mosquitoes

An attempt was made to map the geographic distribution of all the mosquitoes on which point observations were available. The charts present categorized data on all mosquitoes for which information was available in the computer from the articles extracted. In some cases, the information is contradictory. These conflicting observations have been left in the charts with the hope that future surveys and taxonomic-bionomic studies can resolve the inconsistencies. It is hoped that as these inconsistencies are resolved, the documented evidence will be sent to USAMIIA so that the correct information can be included in the computer file on filariasis.

3. Bibliography

Each extracted article was given a document number and the citations were placed in a computer program. The numbers, therefore, refer to the document number and have been cited as such in this report. Microfilmed copies of the documents are available upon request from USAMIIA.

A complete bibliography of the 160 documents extracted is included at the end of this report. Documents referring to specific geographic locations are listed at the end of each section and have been divided into documents containing information on human disease and documents containing information on mosquitoes.

BIBLIOGRAPHY

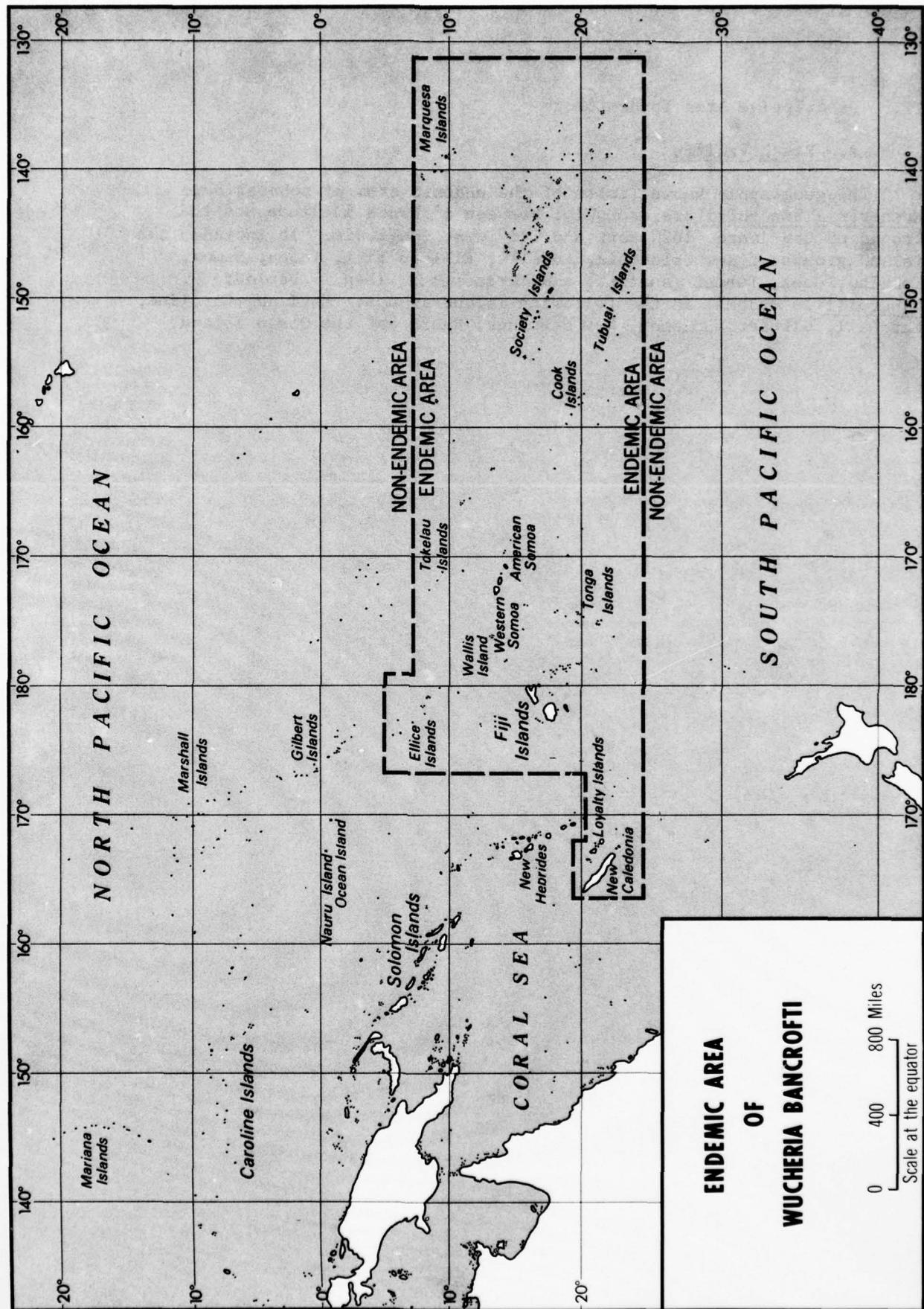
Part II

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III. Descriptive Area Epidemiology

A. South Pacific

The geographic known limits of the endemic area of sub-periodic Wuchereria bancrofti are, roughly, between 5° south latitude and the Tropic of Capricorn, 162° east and 130° west longitude. It includes the island groups of New Caledonia, Loyalty, Ellice, Fiji, Tonga, Samoa, Tokelau, Cook, Tubuai (Austral) and Marquesas. (Map 1) Periodic W. bancrofti is endemic in the following island groups: Mariana, Caroline, Marshall, Gilbert, Solomon, New Hebrides, Nauru and the Ocean Island.



B. Fiji Islands

1. Human Data

Map 2 presents the geographic distribution of the highest prevalence rates recorded in the articles extracted into the Disease Information System. Treatment and mosquito control measures were first introduced in 1952. Since then, treatment of humans and control of mosquitoes have been instituted periodically with the most recent efforts being in 1969, 1970 and 1972. The most recent prevalence rates in the articles in the Disease Information System are presented in Table 1.

2. Mosquito Data

Information on the role and bionomics is presented in Table 2. The numbers refer to the Bibliography. As stated previously, some information is contradictory. It is hoped that such contradictions will be resolved in the future, for little information is available for some species while for others, taxonomic status is uncertain. No attempt was made to provide detailed information on the mosquitoes other than the vector species.

3. Viti Levu

a. Human Data

The geographic distribution of the highest prevalence rates for Viti Levu is presented in Map 3. In general, the rates are in the moderate, (10.0 to 49.9%) range. Most surveys were conducted on the southern coast.

b. Mosquito Data

The geographic distribution of the various mosquitoes for which detailed information on location was available is presented in Maps 4 to 14. As with human surveys, most information is available for the southern coast.

4. Vanua Levu + Tavenui

a. Human Data

The geographic distribution of the highest prevalence rates is presented in Map 15. The majority of the highest rates are in the moderate (10.0 to 49.9%) range with a few in the low (0.1 to 9.9%) range.

b. Mosquito Data

Surveys have been conducted throughout the coastal areas of the islands. Information on these two islands was recorded as either present or absent. The designation of absence of individual mosquito species is of great importance in describing the geographic distribution, particularly if definite areas can be designated as areas where the mosquito species is not found and, thus, the possibility exists that environmental conditions within this area are not favorable for that mosquito species. Still, caution must be observed, and the true designation of absence should be considered truly valid only after repeated surveys. This was not necessarily true in the data used to compile these maps. If a particular species of mosquito has been found to be present in a location recorded as absent, this information should be sent to USAMIIA so that the map can be updated and the error corrected. (Maps 15-23)

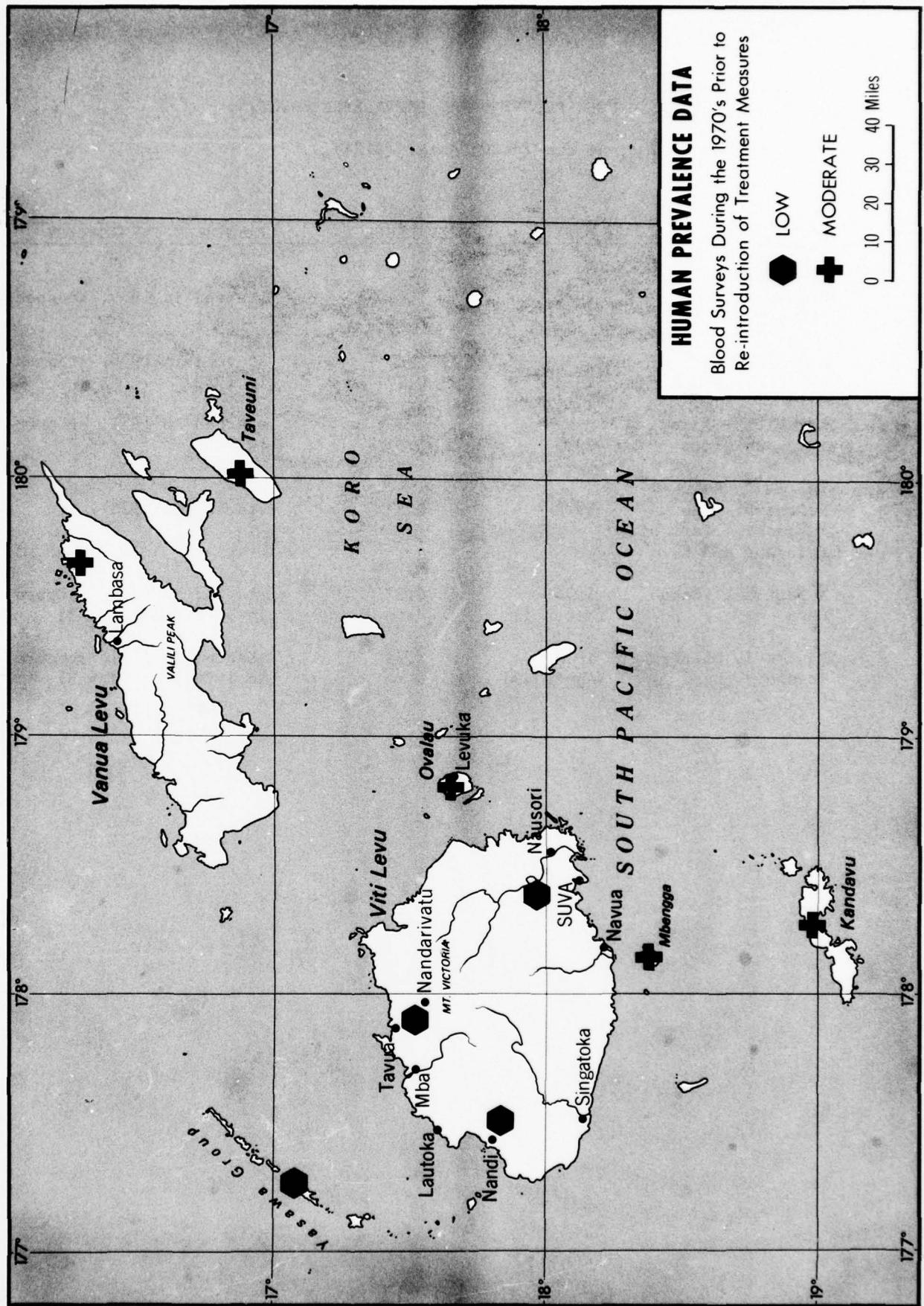


Table 1 FIJI ISLANDS - MOST RECENT HUMAN PREVALENCE RATES

Capillary Blood, 60 cmm (3x20) smear (2124)

LOCATION	DATE	PREVALENCE	TREATMENT INFORMATION
Cakaudrove + Rotuma + Part of Bua + Koro	1972	1.0%	started in 1969, stopped in 1971
Macuata + Part of Bua + Lau Group	1973	0.7%	started in 1970, stopped in 1972
Lomaviti + Kadava + Yasawa Group	1973	0.5%	started in 1971, stopped in 1972
Tailevu + Rewa + Naitasiri + Serua + Namosi + Part of Nadoroga and Ra	1973	0.8%	started in 1972
Nabautini, Vanua Levu	1974 (March 5)	0.0%	started in 1972, stopped in 1974 (February 3)
Raviravi, Mbengga Island	1974 (April 17)	1.7%	started in 1972, stopped in 1974 (February 3)

Table 2
FIJI ISLANDS - MOSQUITO DATA

	ROLE	HABITAT	BREEDING	BITING	REMARKS
* <i>Aedes polynesiensis</i>	major vector. (2042) non-periodic vector. (2036) demonstrated carrier of <i>Microfilaria fijiensis</i> (fruit bat). (2000)	bush. prefers calm or very slightly moving air, not very active in wind moving at more than 3 or 4 knots more numerous in the vicinity of clumps of vegetation or large trees than elsewhere. (2000)	containers, coconut shells, crab holes, tree holes, bamboo. (2000) prolific breeding in piles of coconut shells. groundsites, tree holes, crab holes. (2046)	peak at 1700 to 1900 and in village perimeter. plantations and gardens. few in houses and washing places. (2073)	confined to coastal areas. no obvious concentration of adults in the vicinity of human habitation. active by day. egg stage = 2 to 6 days. larval stage = 6 to 23 days. pupal stage = 2 days. (2000) confined to coastal areas. (2124)
* <i>Aedes pseudoscutellaris</i>	major vector. (2042) demonstrated carrier of <i>Microfilaria fijiensis</i> (fruit bat) and <i>Dirofilaria immitis</i> (dog). (2000)	bush, prefers calm or slightly moving air, not very active in wind moving more than 3 knots. more numerous in the vicinity of clumps of vegetation or large trees than elsewhere. seems to be widely distributed through unoccupied bush. (2000)	containers, coconut shells, crab holes, tree holes, bamboo. (2000) prolific breeding in piles of coconut shells. tree holes, crab holes, leaf axils. (2046)	almost exclusively by day and particularly during the 3 hours before sunset and from 0700 to 0900. (2036)	present in both coastal and inland areas. no obvious concentration of adults in the vicinity of human habitation. present in bush up to 10 miles from nearest village. average egg stage = 3.2 days (2 to 6 days), average larval stage = 10.0 days (5 to 24 days), pupal stage = 2 days. (2000) at 24.1°C duration of stages to nearest day were egg = 2, larva = 8, pupa = 2. (2119) inland. (2124)

additional sources: 2006, 2033, 2061, 2073.

* Major Vector

Table 2 cont.

FIJI ISLANDS — MOSQUITO DATA

	ROLE	HABITAT	BREEDING	BITING	REMARKS
<i>Aedes fijiensis</i>	suspected vector. (2042) demonstrated carrier of <i>Microfilaria fijiensis</i> (fruit bat) and <i>Dirofilaria immitis</i> (dog). (2000)	predominantly in pandanus. some in leaf axils of <i>Alocasia indica</i> . (2042) large axils, tanks, cisterns, major = large pandanus (<i>P. tectorius</i> + <i>P. joskei</i>). minor = leaf axils of taro (<i>Culocasis antiquorum</i> + <i>Alocasia indica</i>). rain water in axils of large pandanus palms. (2000) leaf axils of <i>Pandanus joskei</i> and <i>Pandanus thurstonii</i> . (2046)	night biter. (2042)	becomes active in open at early dusk. (2000) additional sources: 2006, 2061, 2073.	
<i>Aedes aegypti</i>	demonstrated carrier of <i>Dirofilaria immitis</i> (dog). (2000) filarial development to tenth day. occasional full development has been demonstrated. (2036)	containers and coconut shells, wells. (2000)	at 24.1°C duration of stages to nearest day were egg = 2, larvae = 11, pupa = 2. (219)	additional sources: 2033, 2046.	
<i>Aedes freycinetiae</i>	probable non-vector. (2046)	lives in rain forests and axils of freycinetia pandanus. stays away from houses. (2046)	will not feed on man in captivity. (2046)	18	

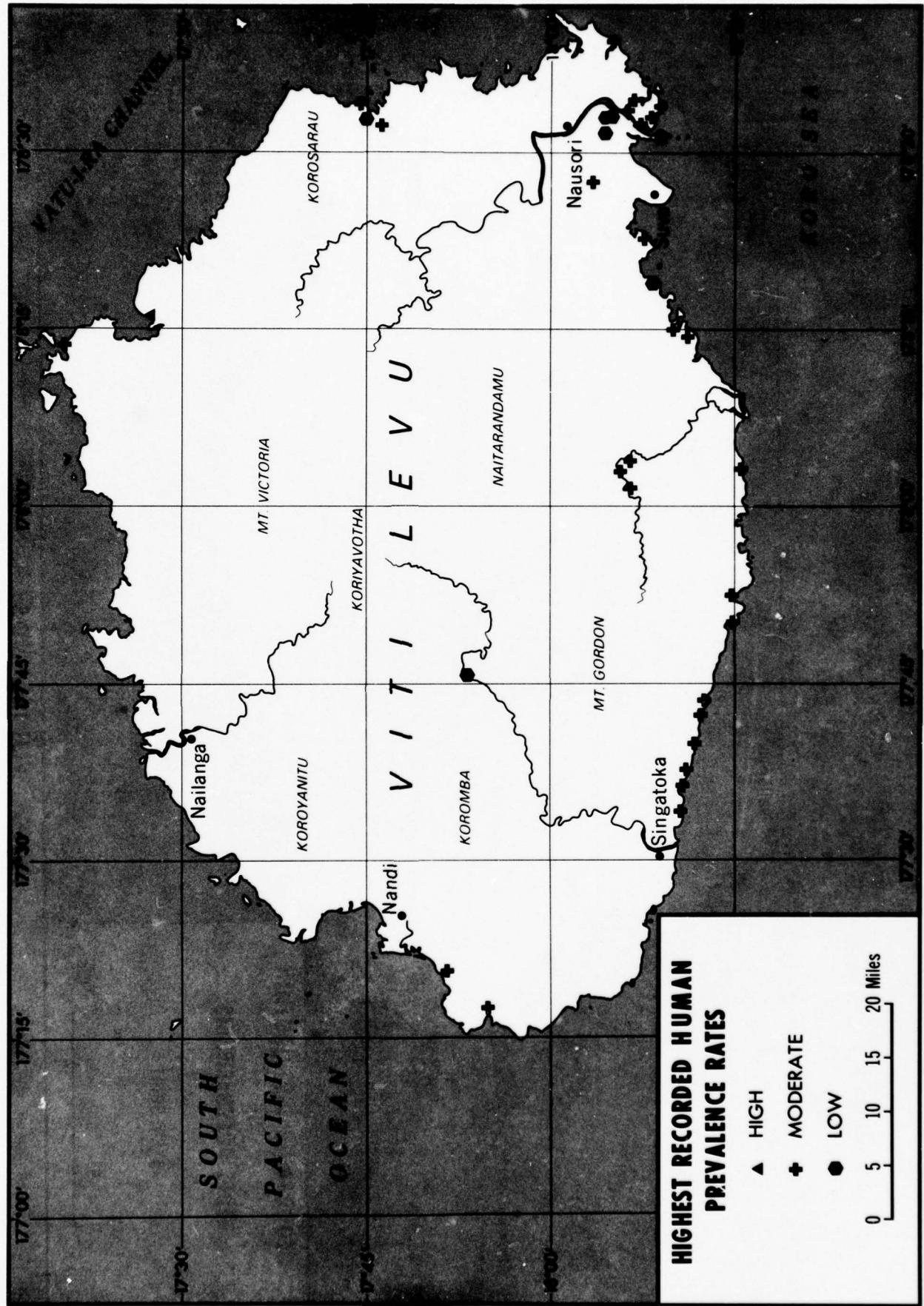
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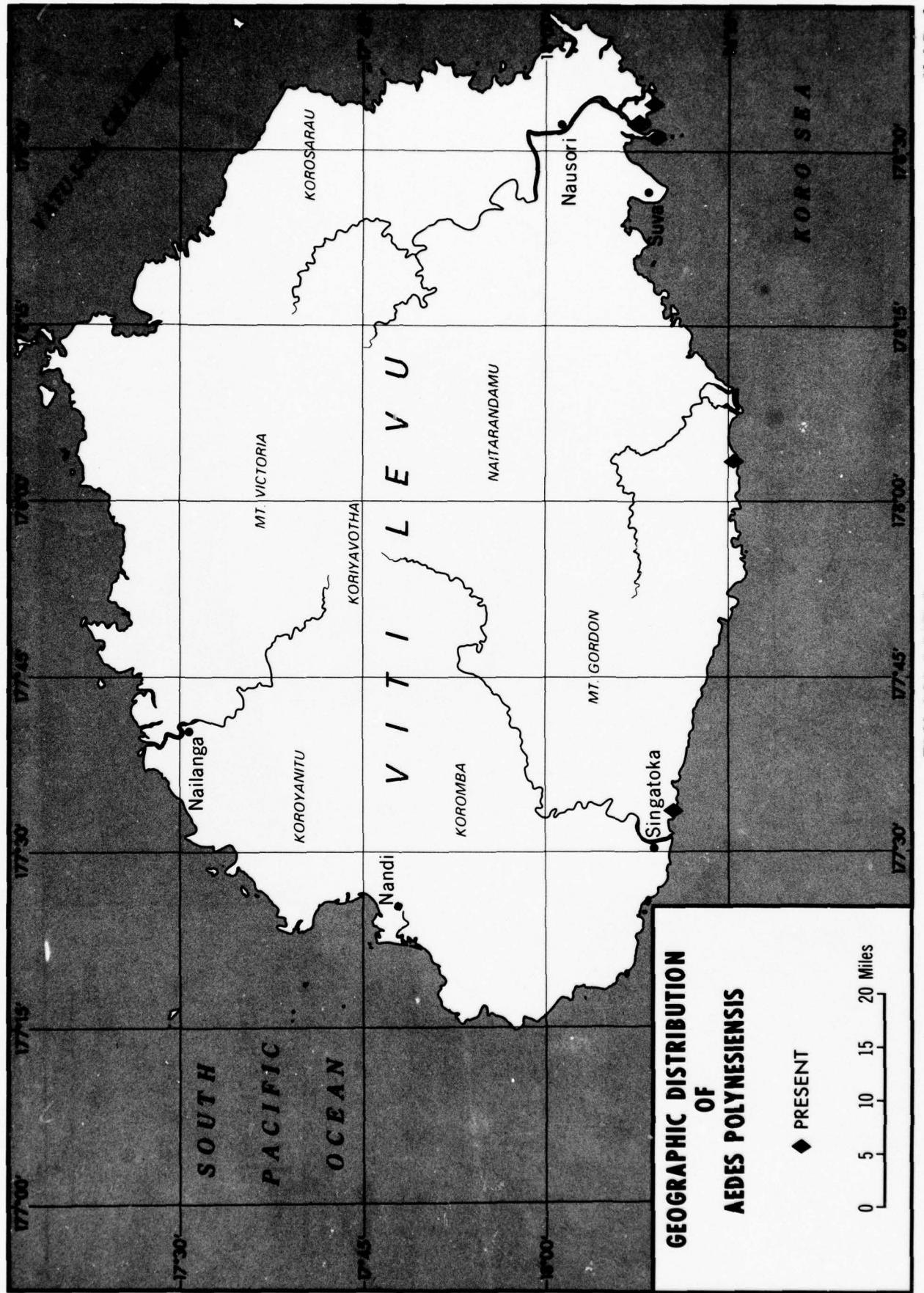
FIJI ISLANDS — MOSQUITO DATA

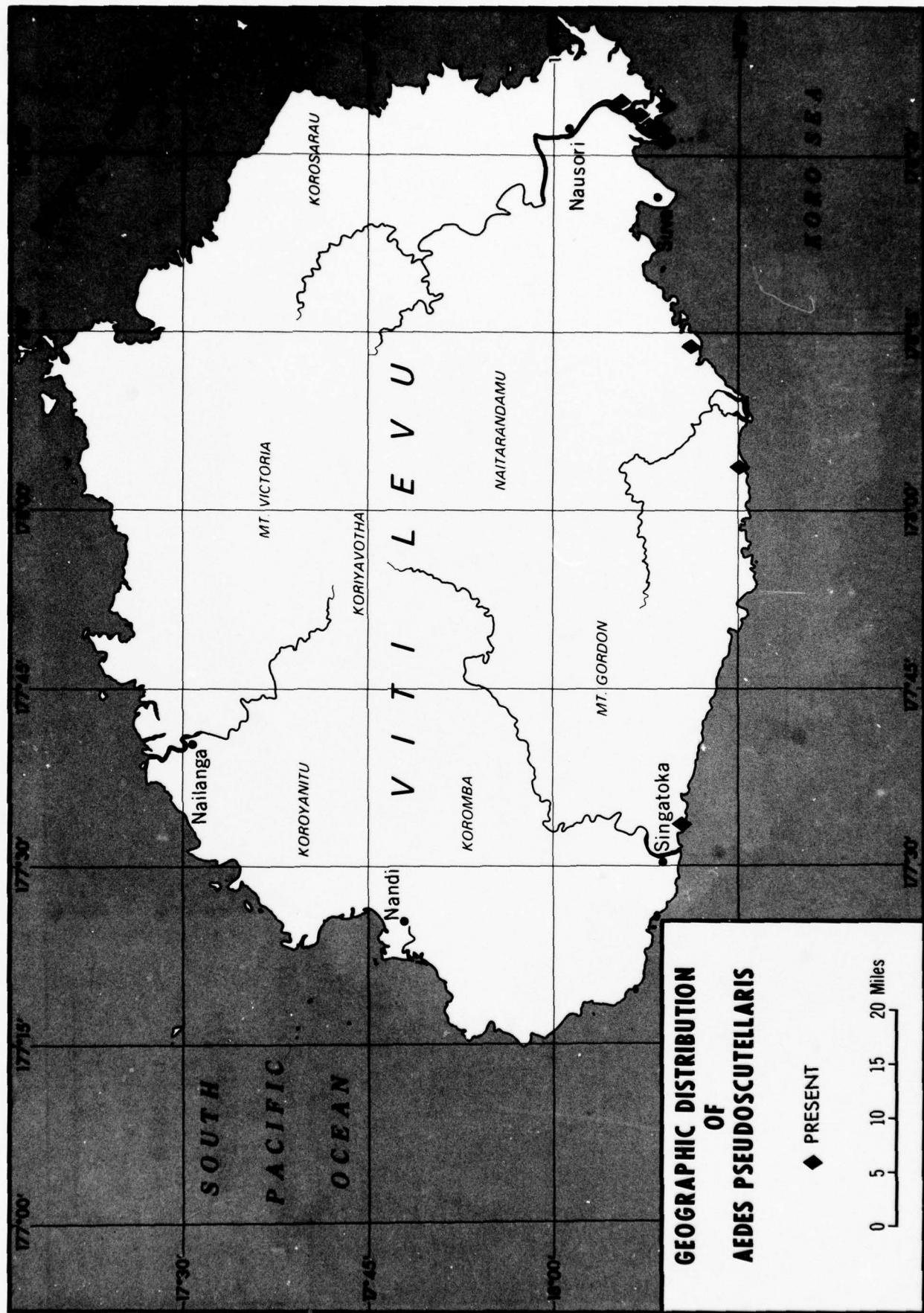
	ROLE	HABITAT	BREEDING	BITING	REMARKS
<i>Aedes horrescens</i>		muddy water in tree holes of forest trees such as screw pine, ivi, breadfruit and tree ferns. (2036)			Taveuni and Viti Levu. (2036)
<i>Aedes rotumae</i>	suspected vector. (2042)		rain water containers, tins, coconut shells. (2042)		
<i>Aedes suvae</i>			crab holes, groundsites, tree holes. (2046)		additional source: 2000.
<i>Aedes vexans</i>	demonstrated carrier of <i>Dirofilaria immitis</i> (dog). (2000)		ponds, pools, pitted land. (2000) groundsites, crab holes. (2046)		population fluctuates strikingly with rainfall. (2000) additional sources: 2006, 2073.
<i>Aedes vigilax</i>	poor vector. (2046)		brackish water, groundsites, crab holes. (2046)		thought introduced in 1957. serious pest in early 1958, but population nearly destroyed by heavy rains in April, 1958. did not return to eastern (wet) Viti Levu but persists on dry side and on islands of Malolo, Tavua, Yanuga and Makogai. (2046)
<i>Culex annulirostris</i>	demonstrated carrier of <i>Dirofilaria immitis</i> (dog). (2000)	comm on in houses. peak hour in hut = after 0300. (2000)	crab holes, drains, ponds, pools, pitted land. (2000) groundsites. (2046)		at 24.1°C duration of stages to near day were egg = 2, larva = 8, pupa = 2. (2119) additional sources: 2006, 2073.

Table 2 cont.
FIJI ISLANDS - MOSQUITO DATA

ROLE	HABITAT	BREEDING	BITING	REMARKS
<i>Culex fatigans</i>	common in houses. (2000) insignificant vector based on lack of evidence of intrafamilial transmission. (2004)	almost any stagnant water surface. - containers, coconut shells, crab holes, drains, drums, ponds, pools, pitted land, pit latrines - 4 to 12 feet deep. (2000) demonstrated sufficient vector of nocturnal bancrofti but no infections detected in those caught in native houses. (2036)	at 24.1 °C duration of stages to nearest day were egg = 2, larva = 13, pupa = 2. (2119) additional sources: 2006, 2042, 2061, 2073.	become active in open at early dusk. egg stage = 1 to 2 days, larval stage = 8 to 24 days, mean = 14 days, pupal stage = 2 days. (2000)
<i>Culex sitiens</i>		groundsites. (2046)		at 24.1 °C duration of stages to nearest day were egg = 2, larvae = 10, pupa = 4. (2119) additional source: 2073.
<i>Taeniorhynchus purpurata</i>		tree holes, crab holes. (2046)		

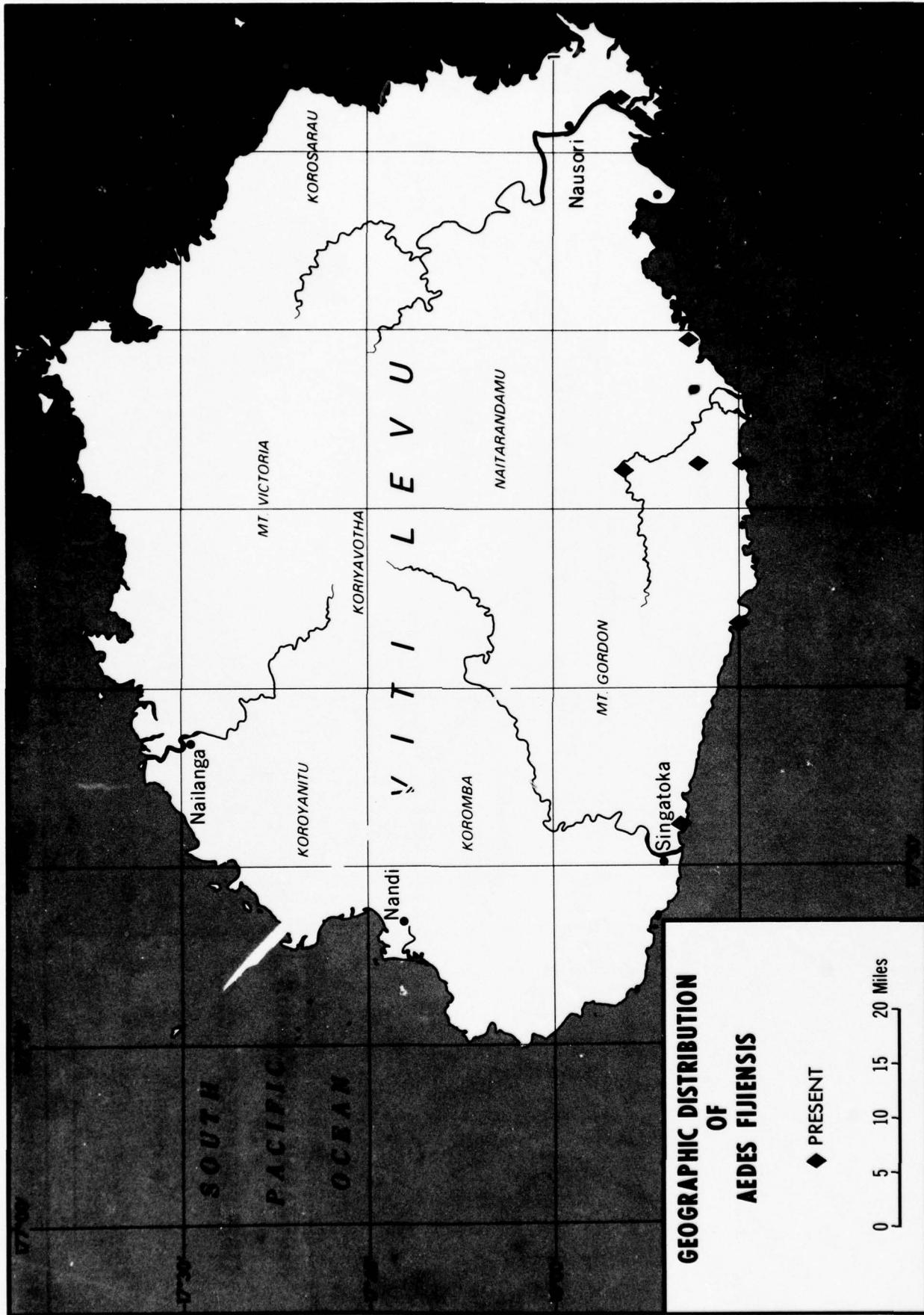


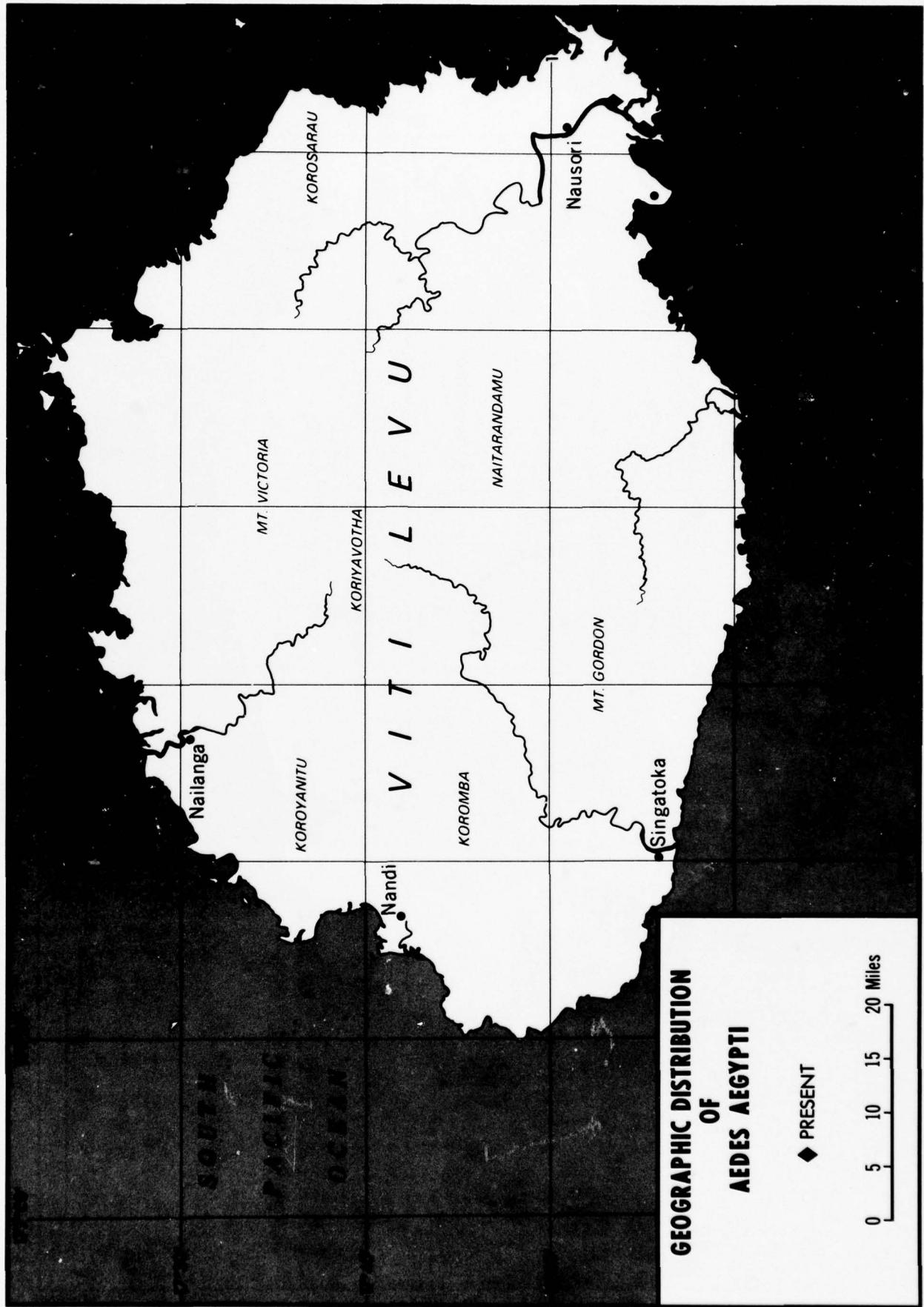


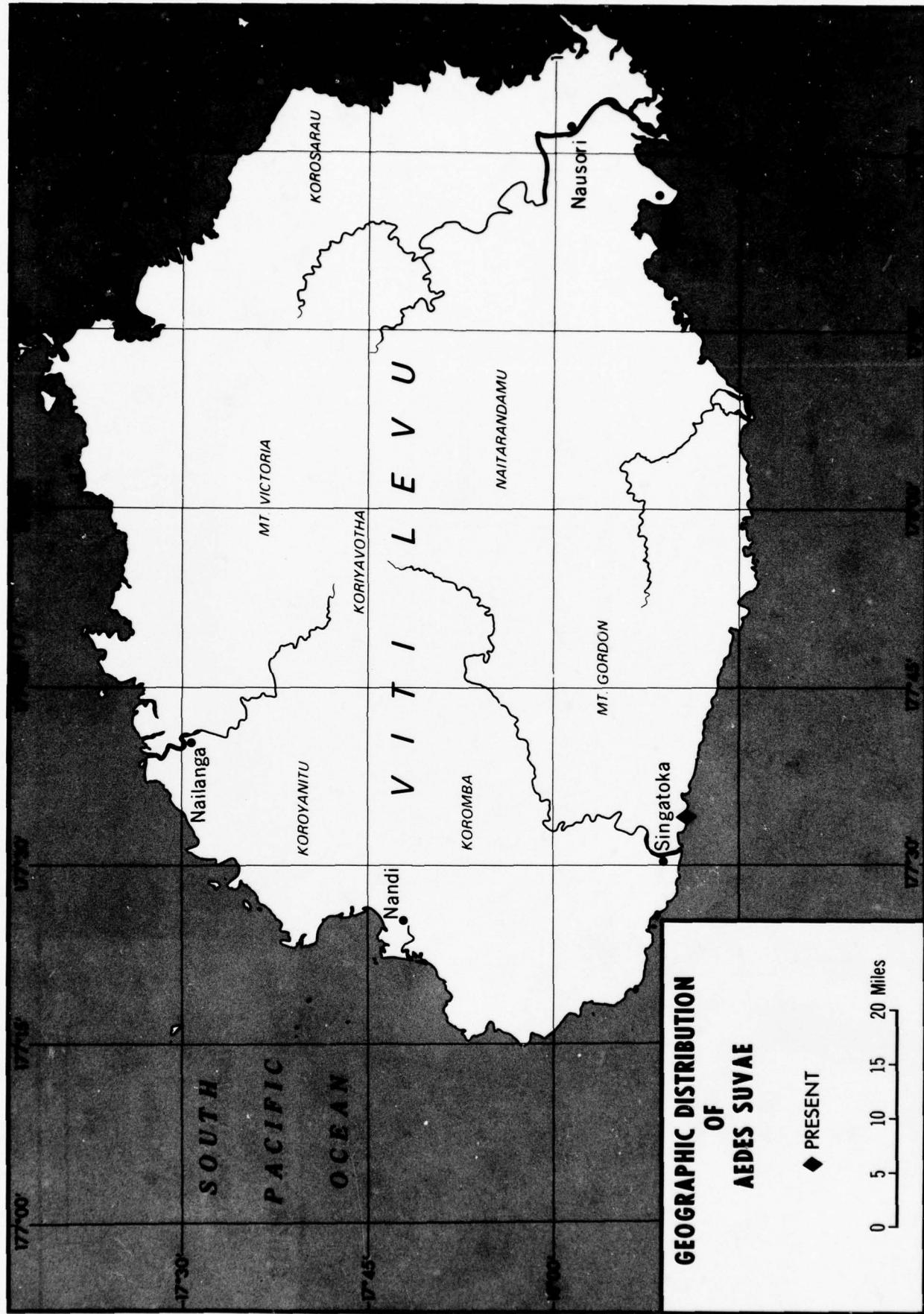


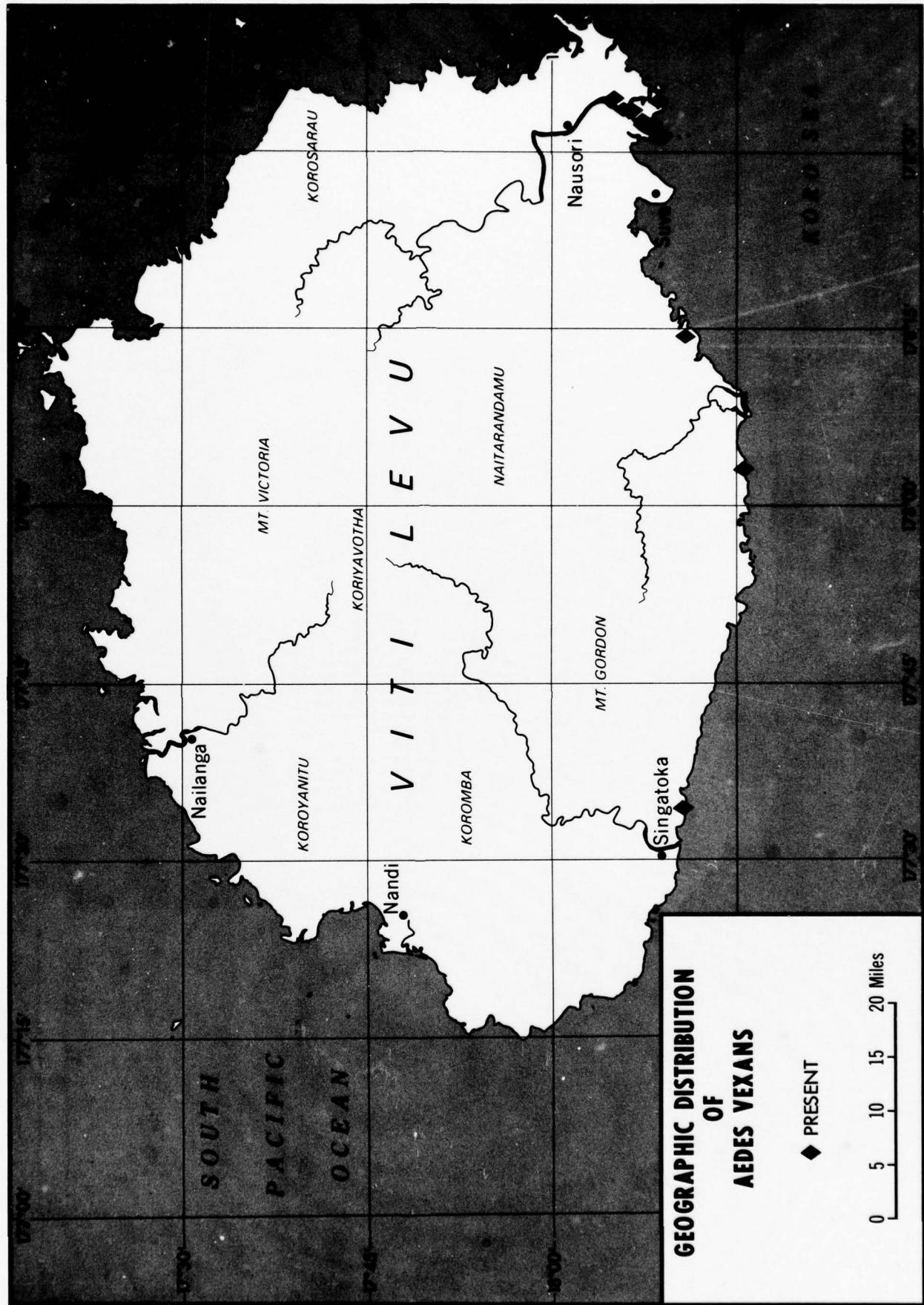
Fiji Islands

MAP 6





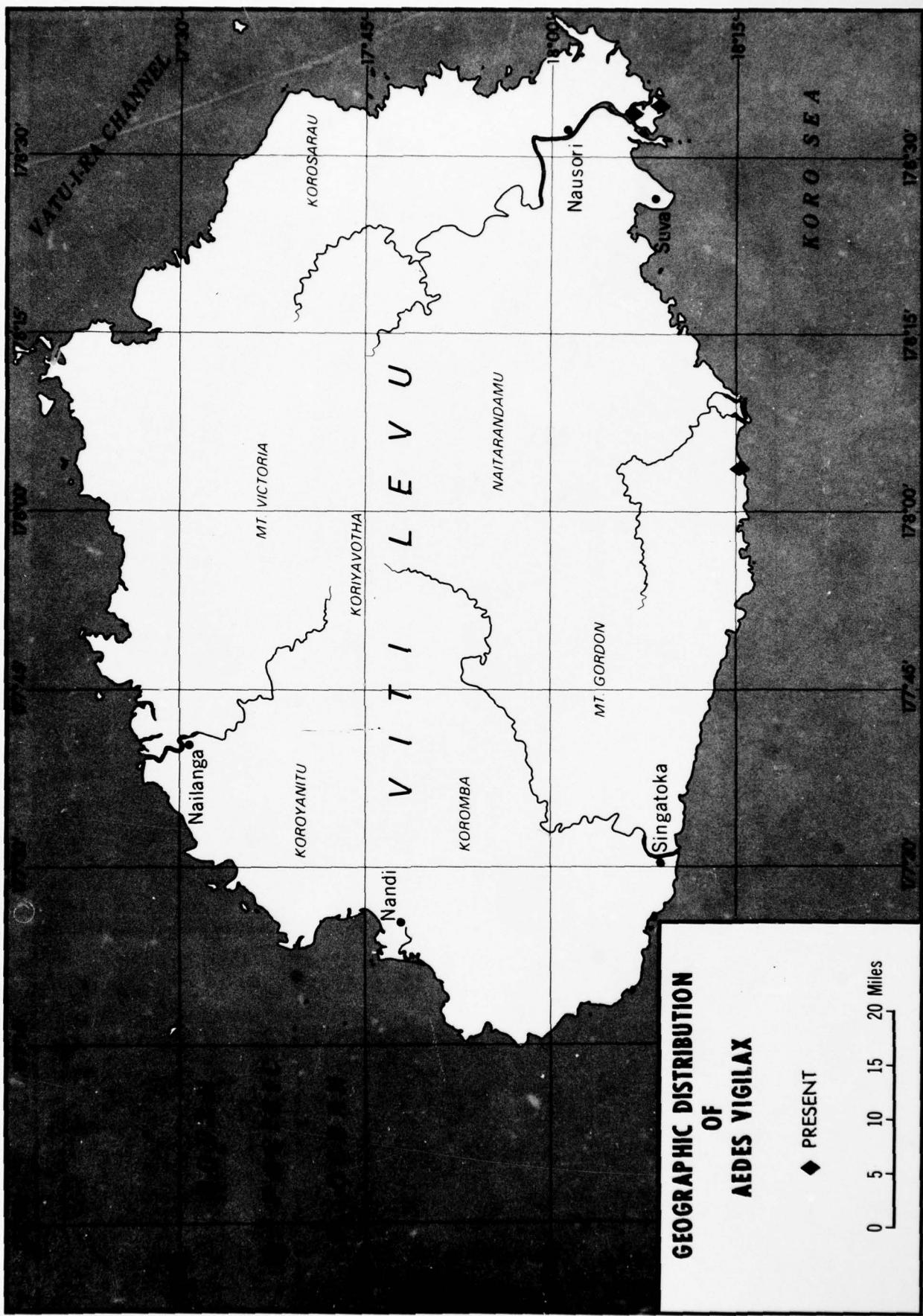


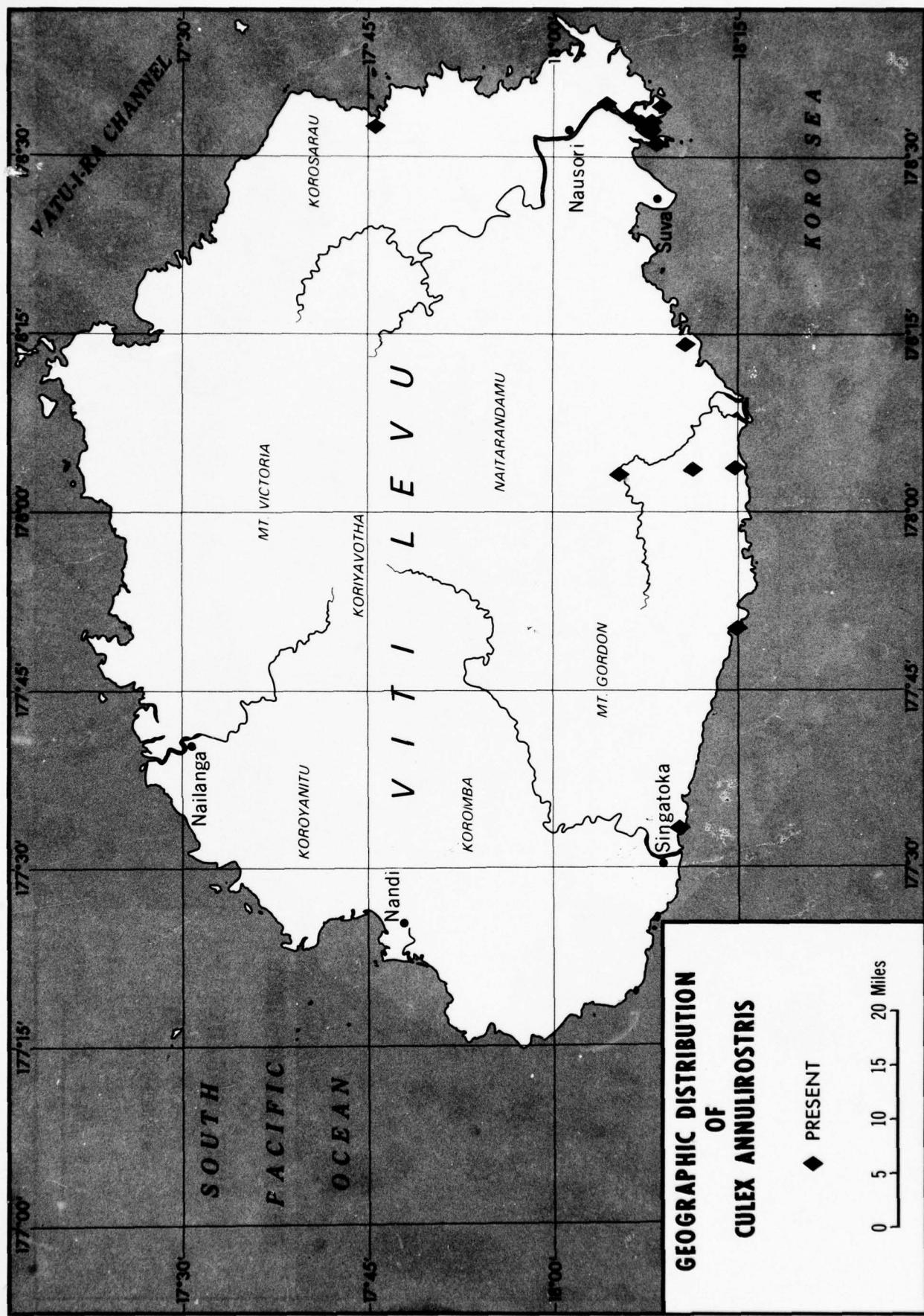


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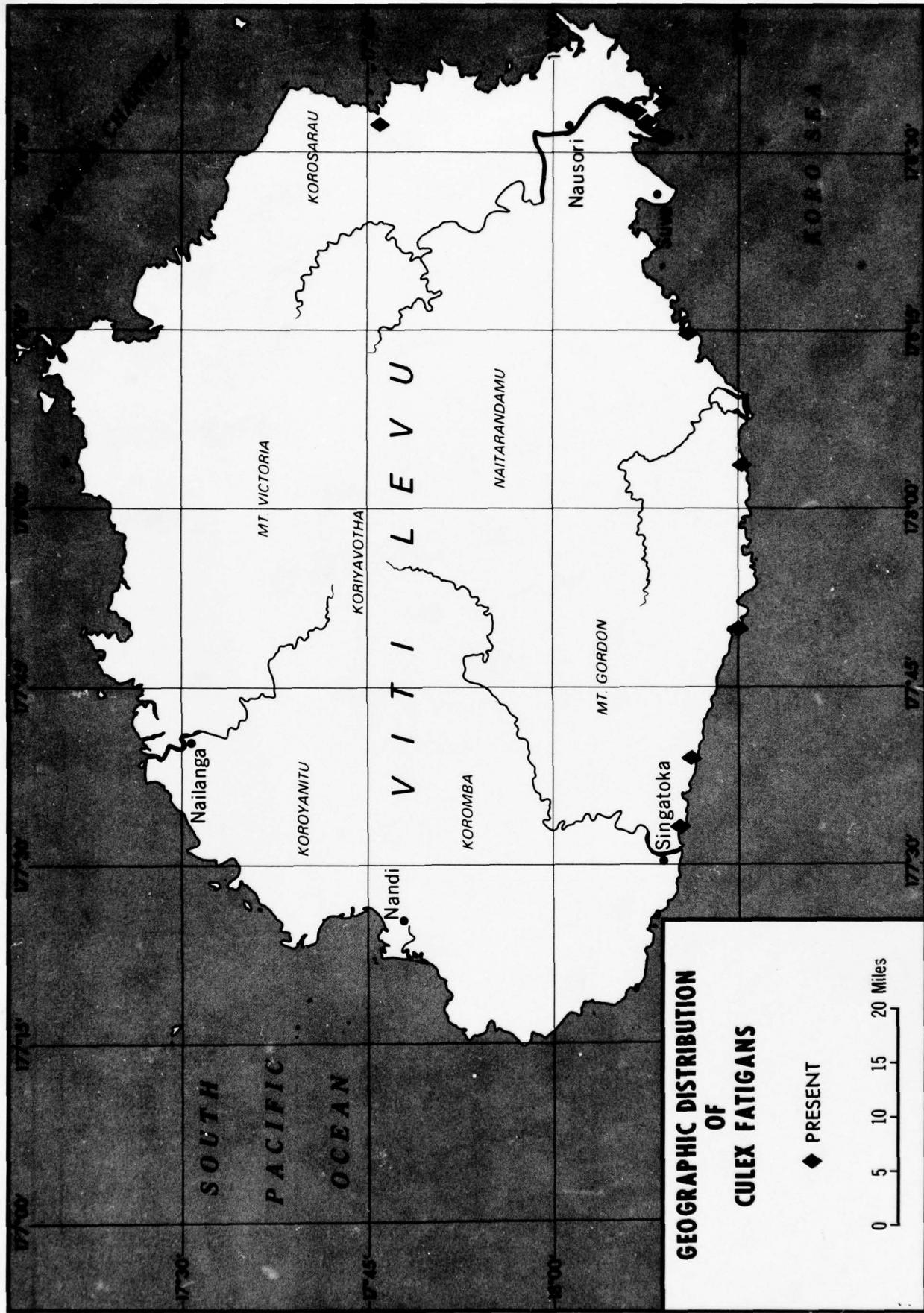
MAP 10

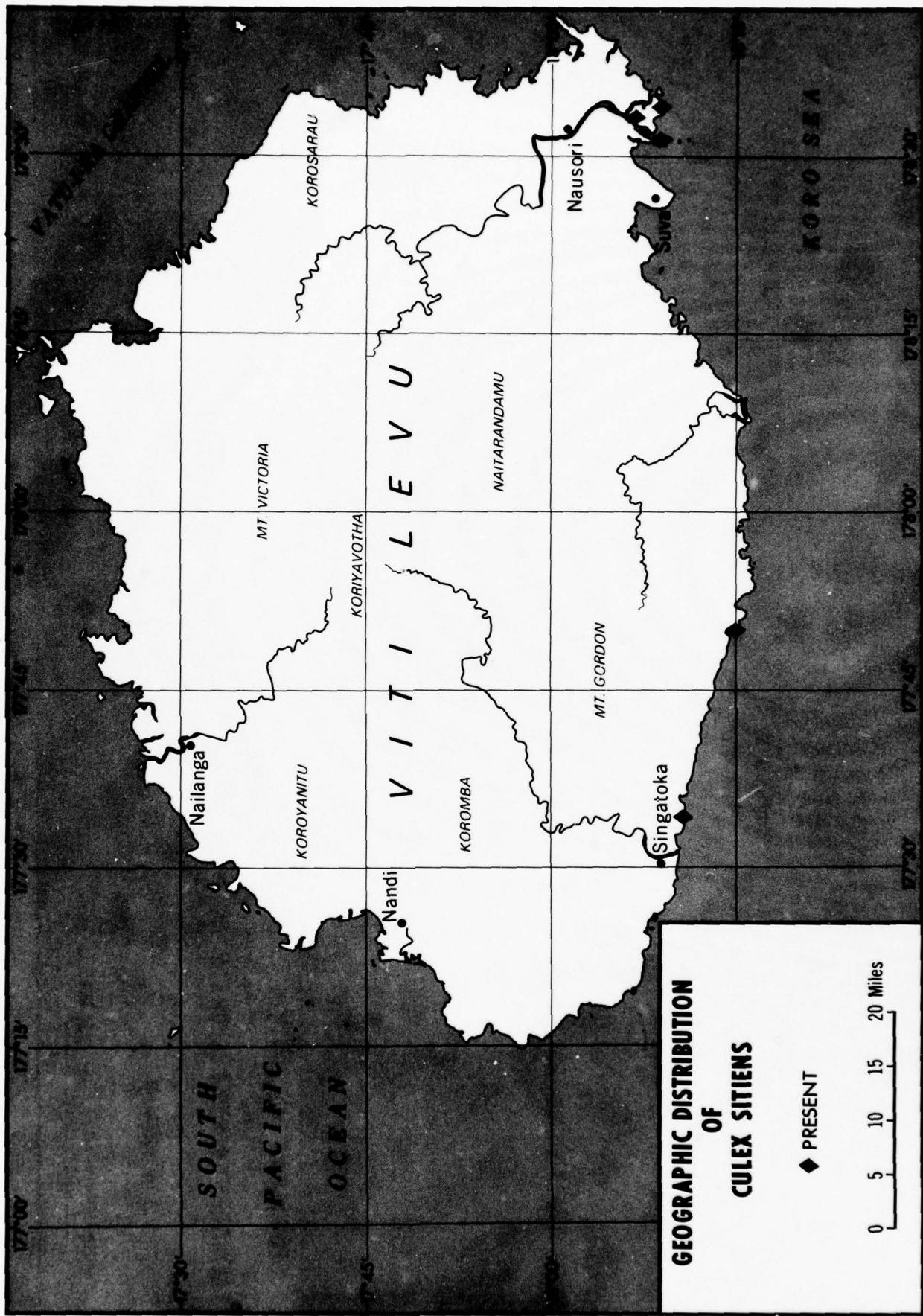


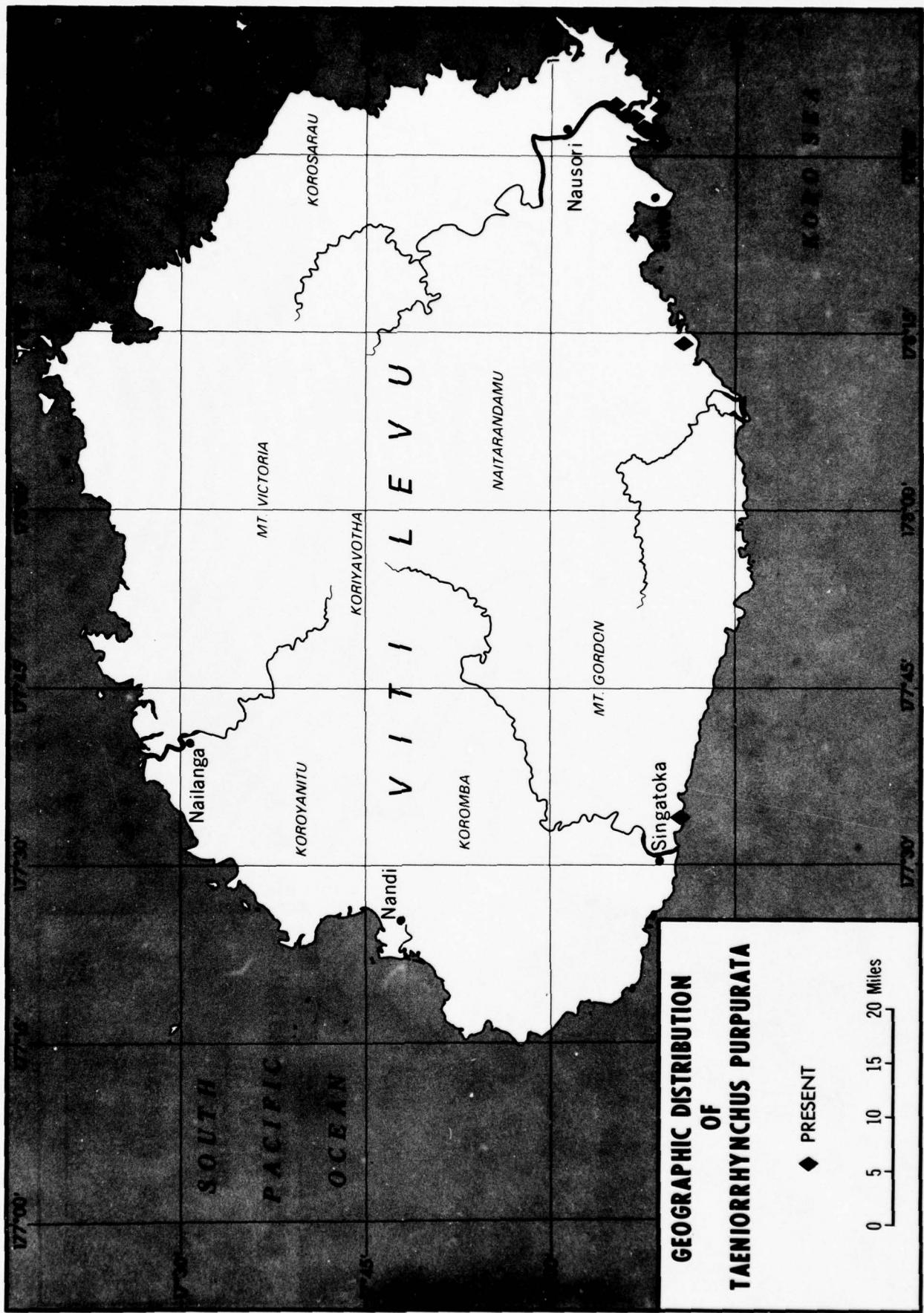


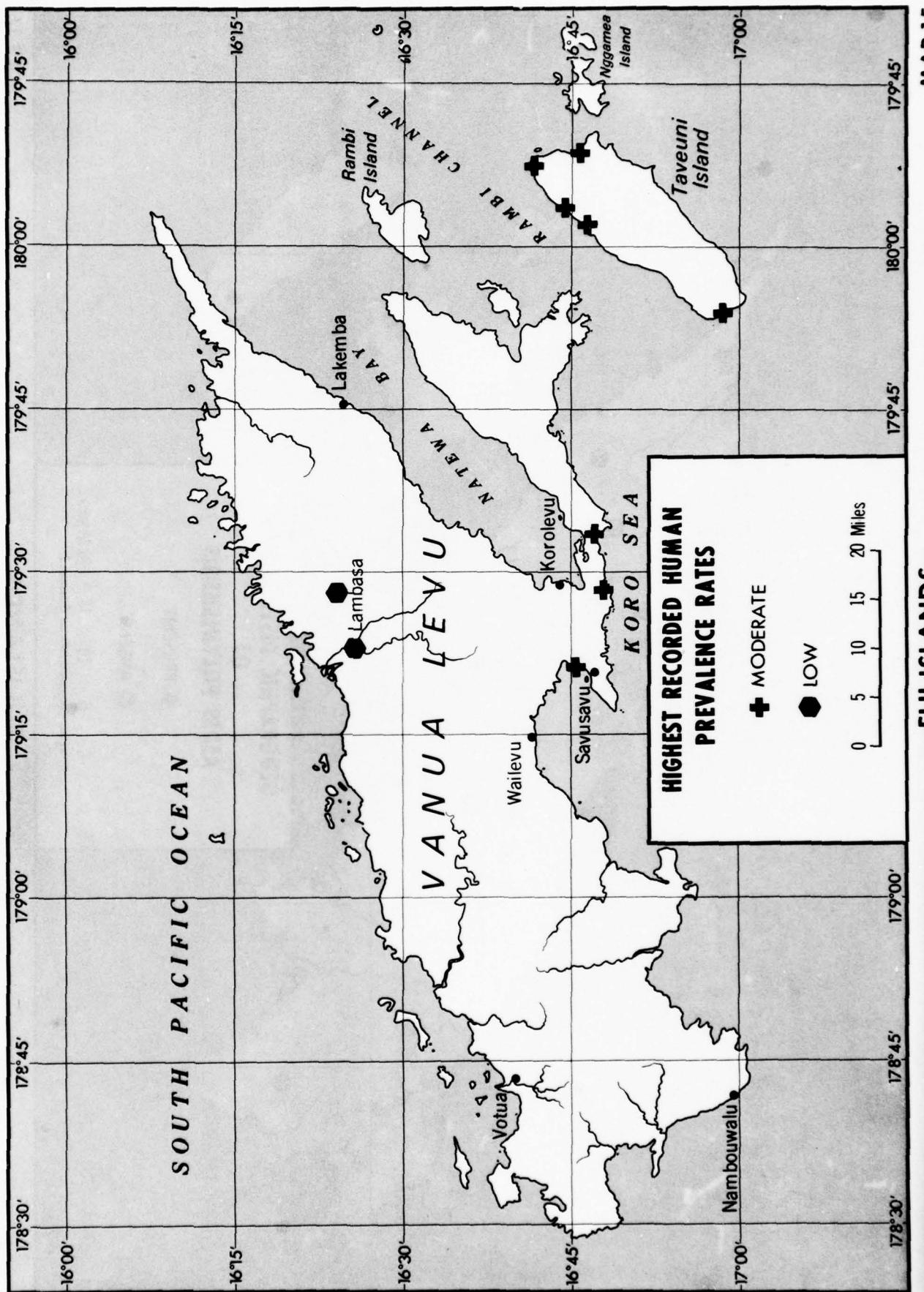
MAP 12

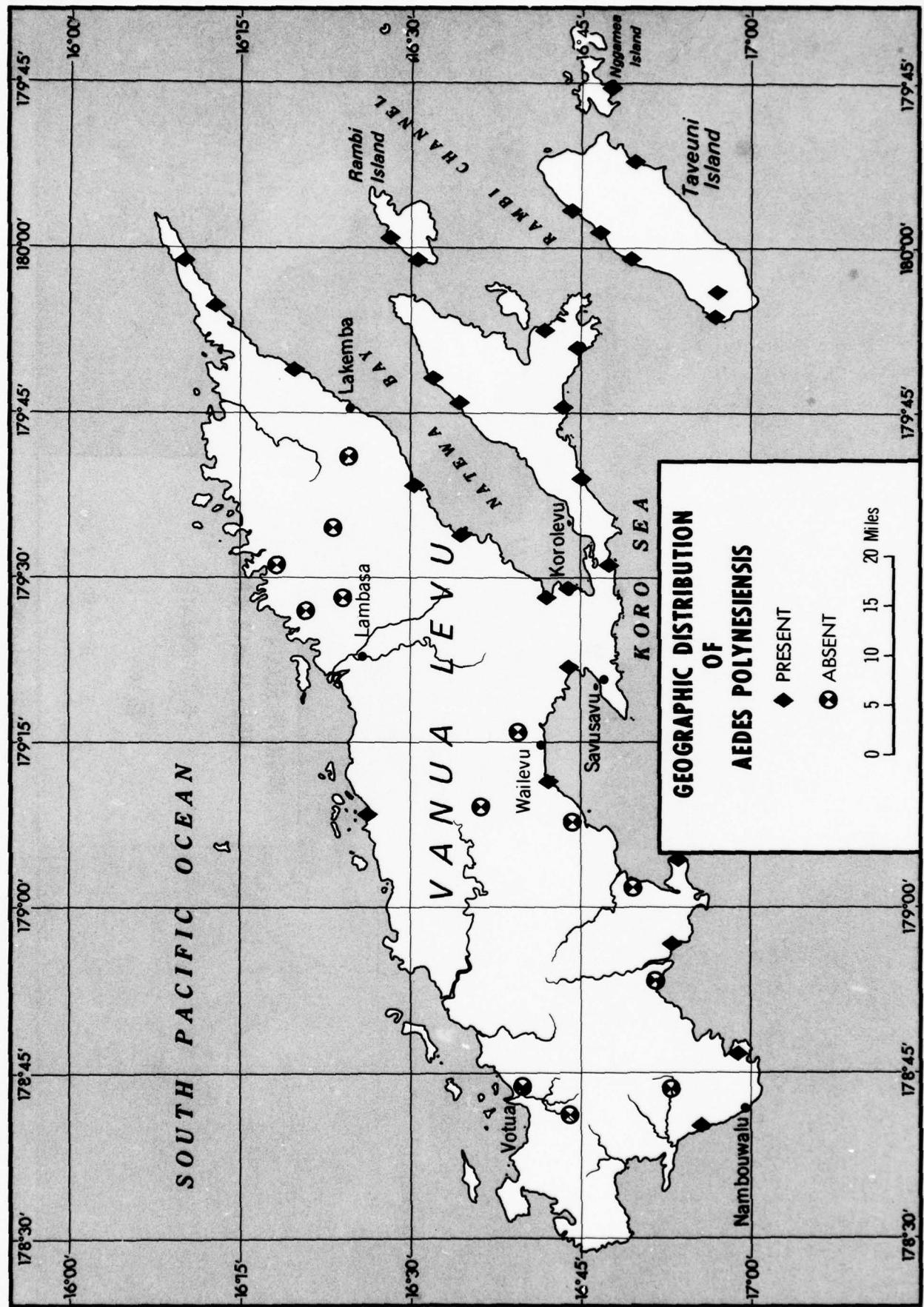
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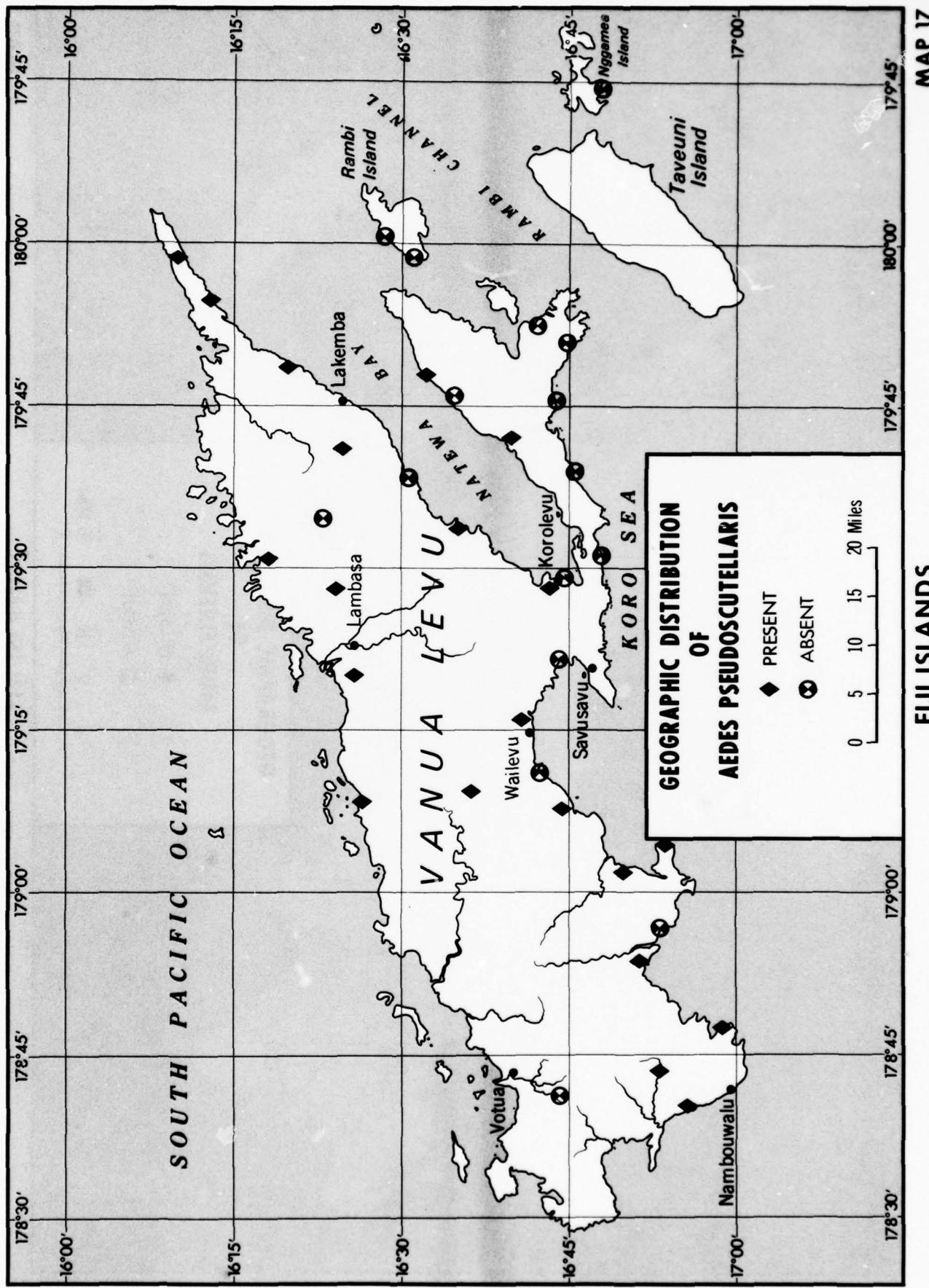


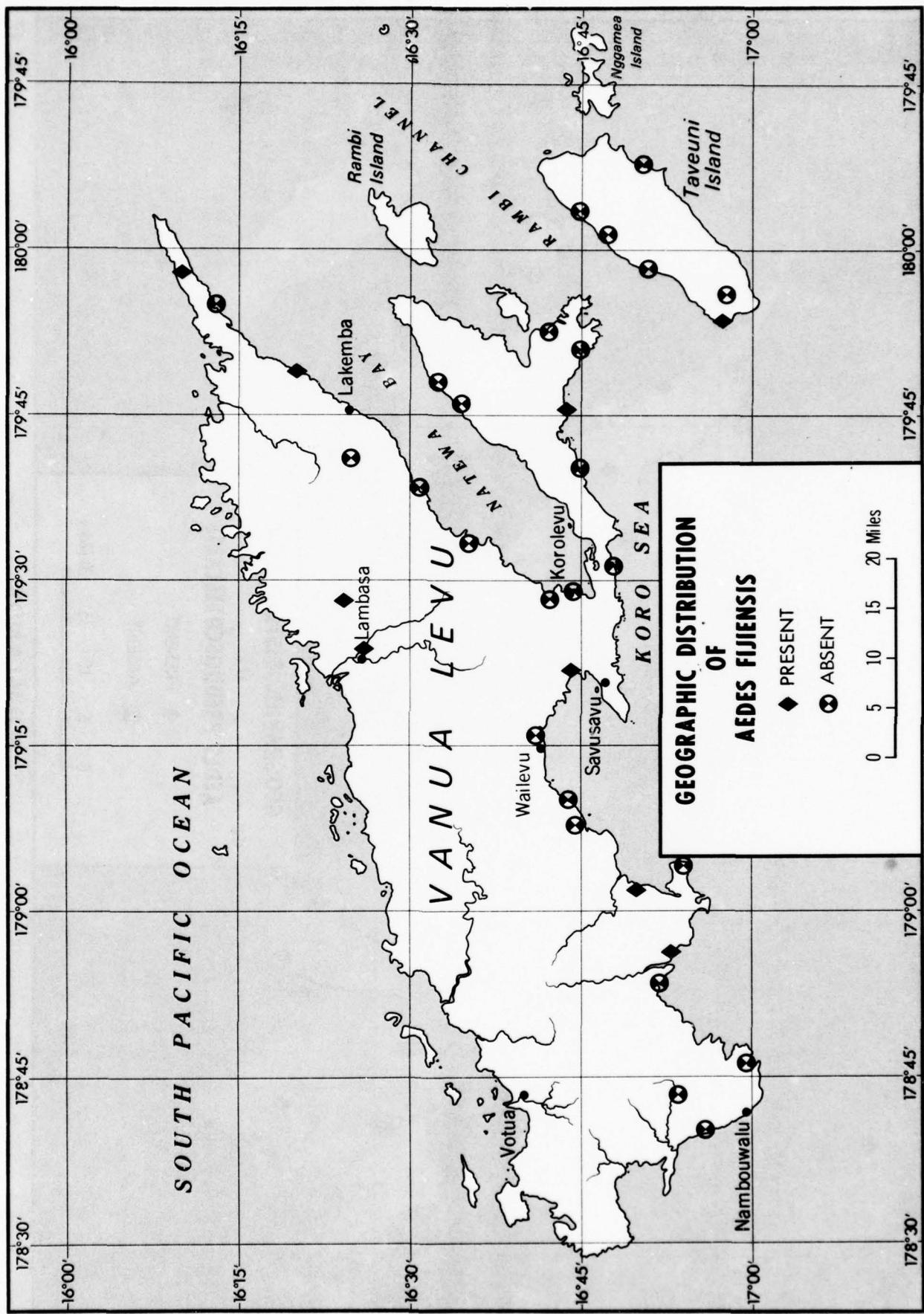




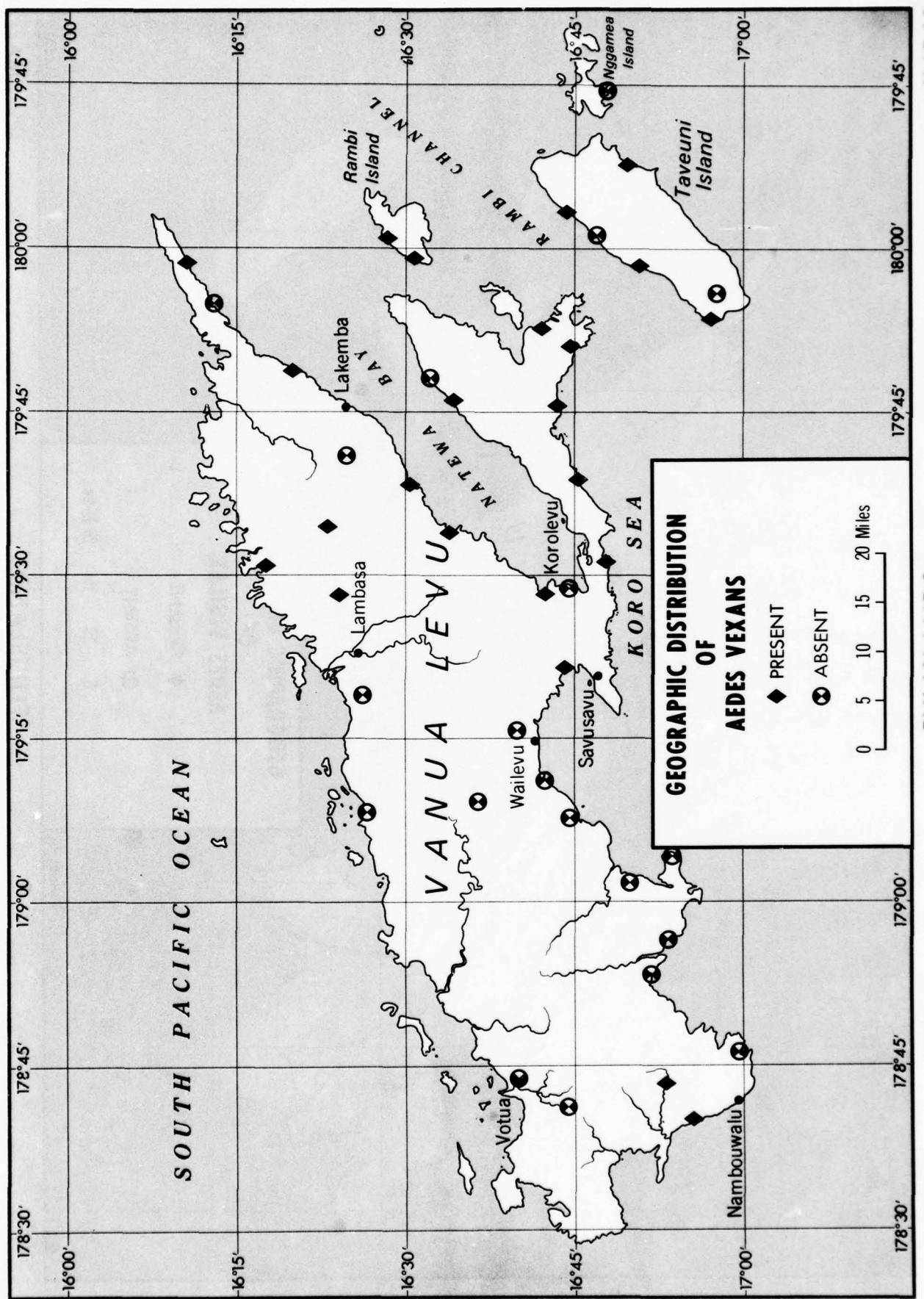


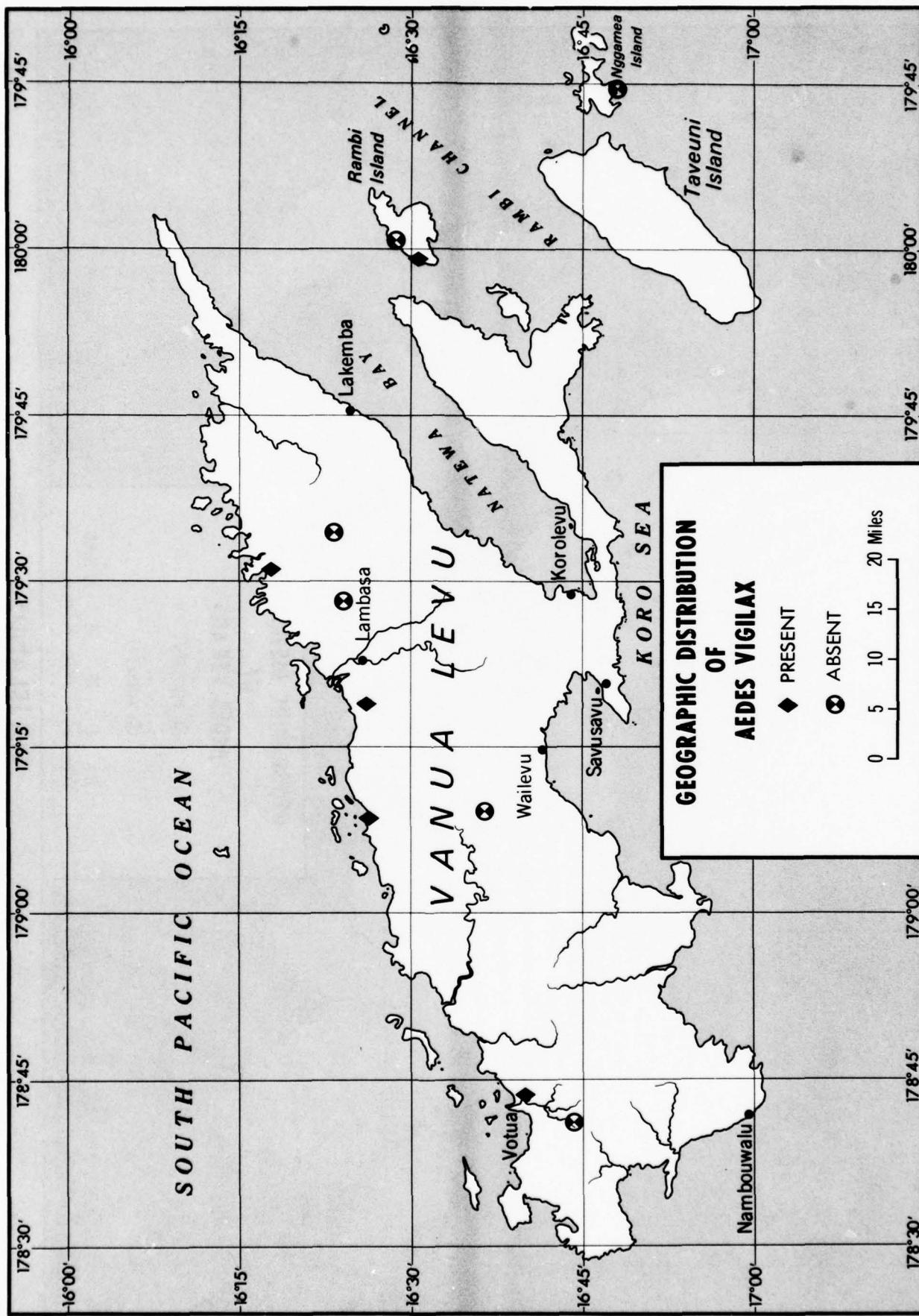




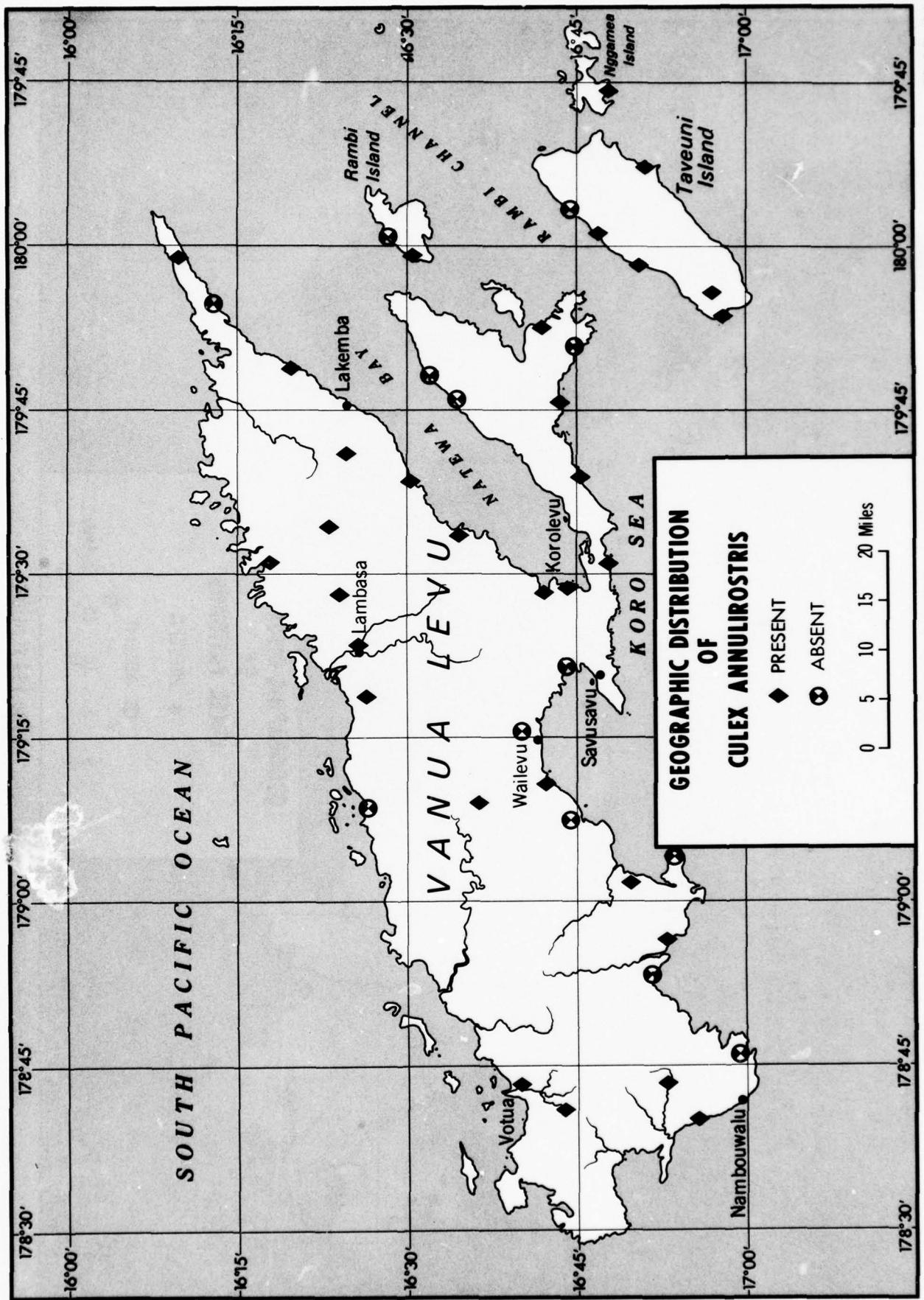


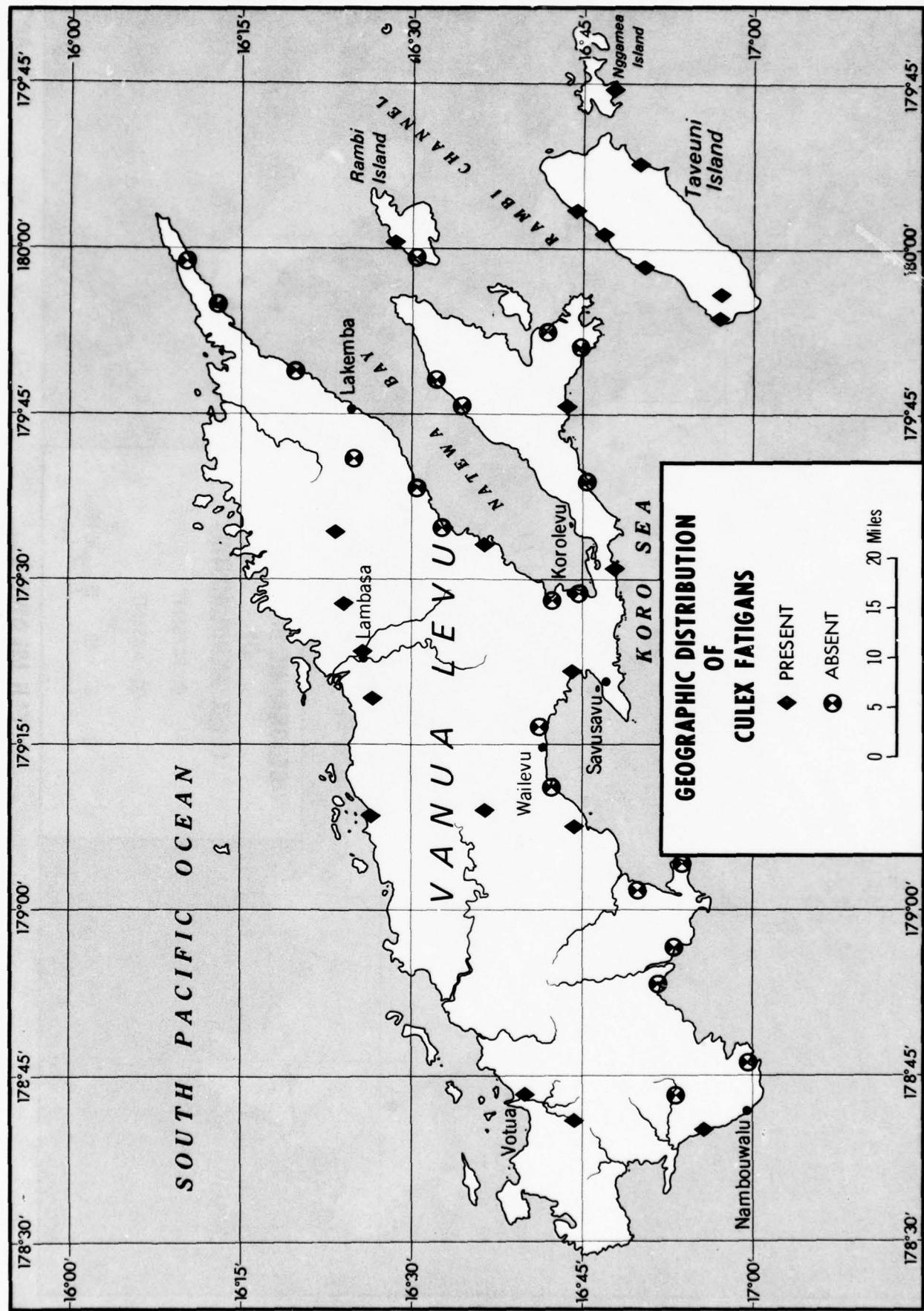
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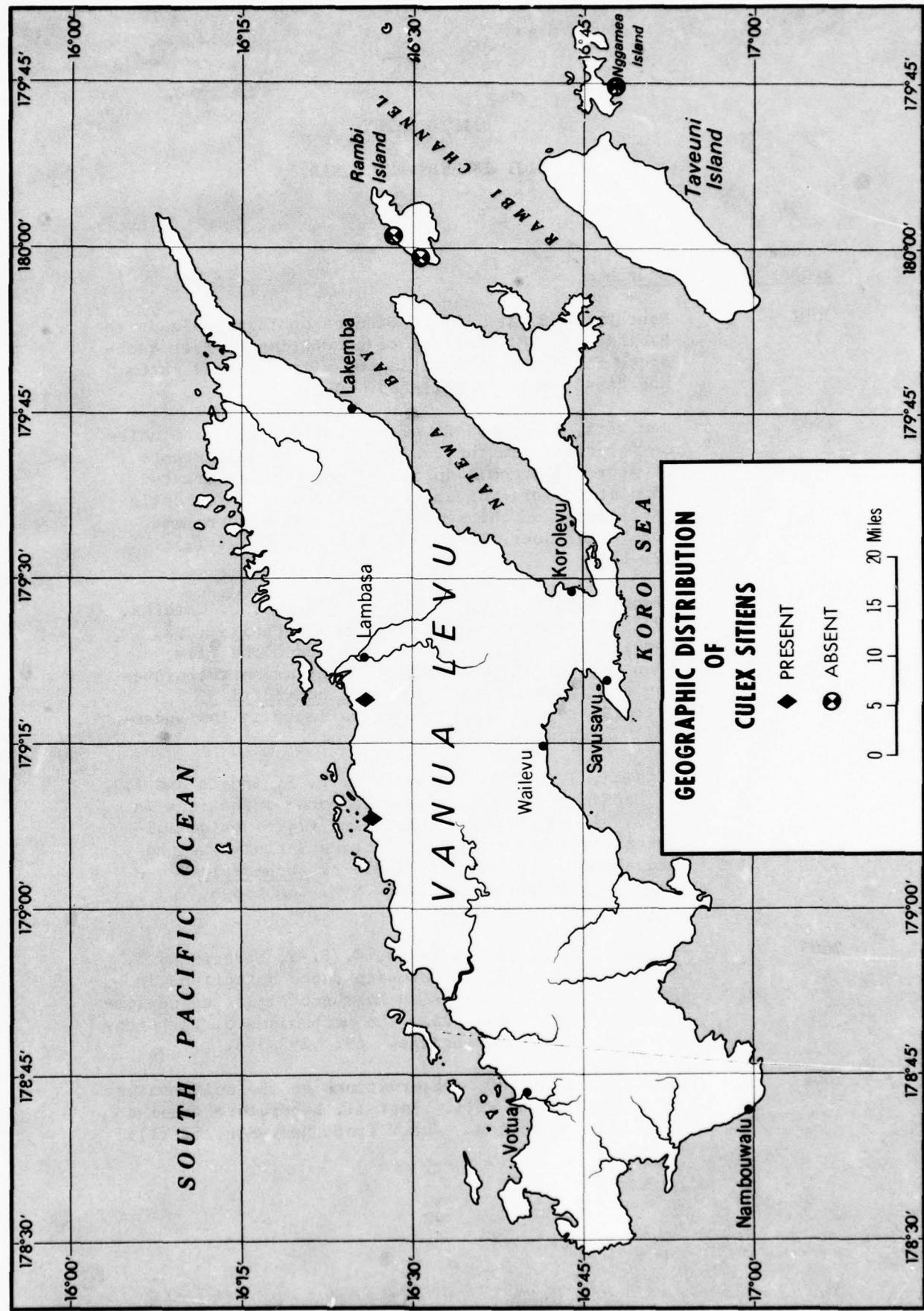
FIJI ISLANDS





MAP 22

Fiji Islands



FIJI ISLANDS

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C. Western Samoa

1. Human Data

Treatment and control measures were first introduced in 1964 with major efforts in 1965 and 1966. The last recorded effort in treatment was in 1971. Most detailed information was available for the island of Upolu. The highest prevalence rates recorded in the Disease Information System were in the moderate (10.0 to 49.9%) range. (Map 24) After treatment and control measures were introduced, the prevalence rates dropped to less than 5%. (Table 3)

2. Mosquito Data

Information on the role and bionomics is presented in Table 4. Information on the geographic distribution of the various mosquito species is presented in Maps 25-30.

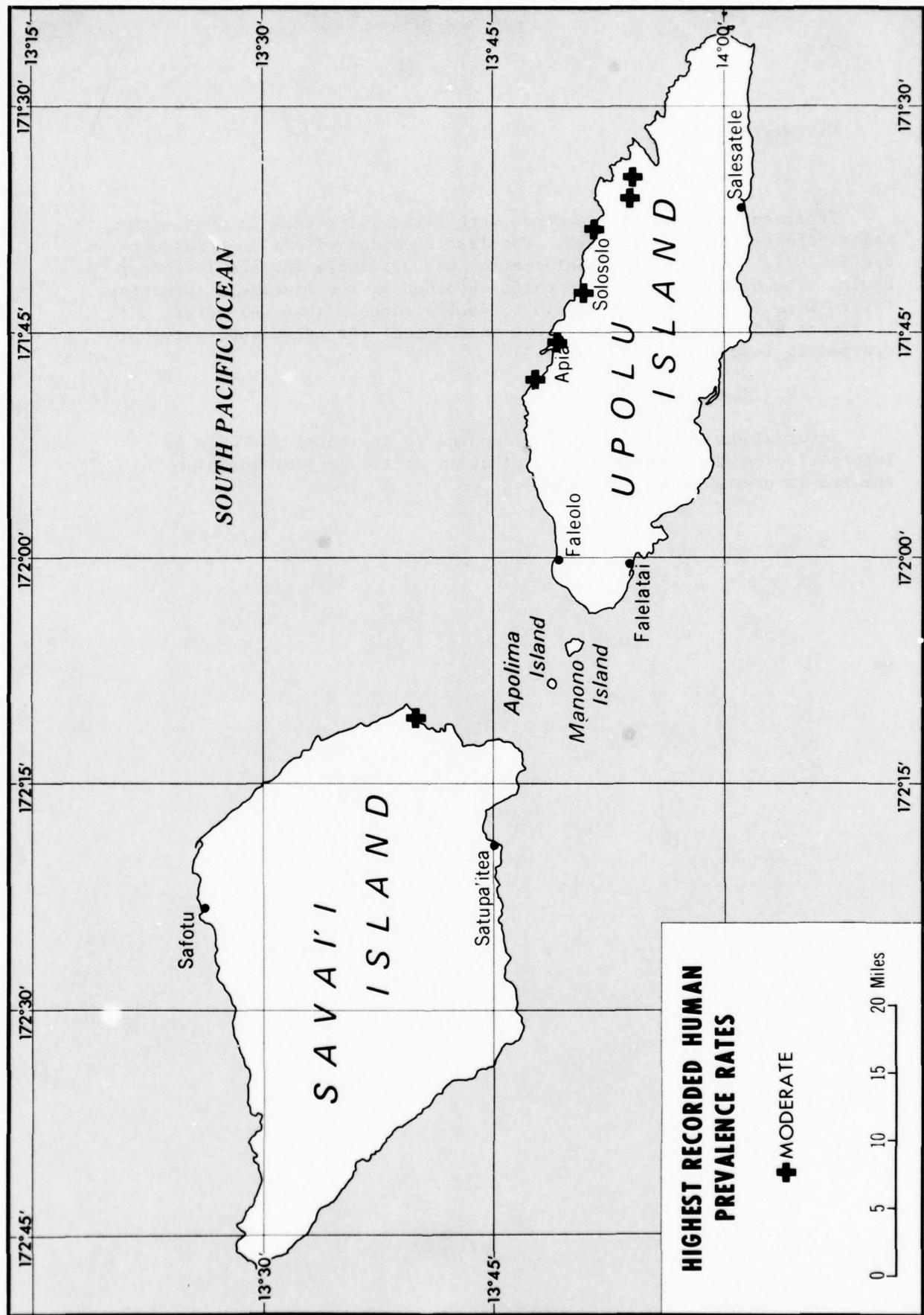


Table 3
WESTERN SAMOA — MOST RECENT PREVALENCE RATES

LOCATION	DATE	MATERIAL	METHOD	PREVALENCE	TREATMENT INFORMATION
WESTERN SAMOA (2024)	1973	venous blood	1.0 ml. filtration	24.7%	last treated in 1971. treatment started in 1965. second round 1970 to 1971.
	1973			0.1%	
SAVAI'I Satufa'itea (2042)	1964	capillary blood	20 cmm smear	0.6%	3 to 15 months post treatment
UPOLU					
Lefaga (2042)	1966	capillary blood	20 cmm smear	1.8%	3 to 15 months post treatment
Falevao (2126)	1966	capillary blood	20 cmm smear — giemsa stain	2.4%	20 months post treatment
Lalomauga (2126)	1966	capillary blood	20 cmm smear — giemsa stain	4.4%	20 months post treatment
Solosolo (2126)	1966	capillary blood	20 cmm smear — giemsa stain	3.6%	20 months post treatment
Toamua (2126)	1966	capillary blood	20 cmm smear —	2.4%	20 months post treatment

Table 4
WESTERN SAMOA — MOSQUITO DATA

ROLE	HABITAT	BREEDING	BITING	REMARKS
* <i>Aedes polynesiensis</i>	<p>does not rest in houses. (2126)</p> <p>verandah of school building, Samoan "fale", outside on grassy ground under a tree. resting - present in shaded areas, absent in unshaded areas. (2128)</p>	<p>tree holes, rock holes, crab holes, coconut shells, large and small artificial containers, pandanus leaf axils, banana stumps, ground pools, cacao pods. (2020)</p> <p>tree holes, unused toilet, druti. (2127)</p> <p>tree holes, rock holes drums, motor tires, coconut shells, tin cans, bowl, unused toilet. (2128)</p>	<p>significantly greater biting densities outdoors than indoors. larger numbers collected at night, increasing on moonlit nights. evening peak greater than morning peak. (2100)</p> <p>morning peak 0800 to 0830, afternoon peak 1700 to 1830. no clear relationship between biting activity and temperature and relative humidity. (2100)</p>	<p>density peaks app. 2 weeks after heavy rainfall. (2100)</p> <p>possibly greater vector efficiency than <i>Aedes samoanus</i>. (2101)</p> <p>domestic demands for wood, clear village areas decreasing breeding sites. (2010)</p> <p>prevalent throughout the country. (2126)</p> <p>two peaks of activity -- one = 0600 to 1000 with highest peak at 0800. second = 1500 to 1800 with highest peak between 1700 and 1800. (2129)</p> <p>additional source: 2024.</p>
			<p>most active between 0700 to 1000 and 1500 to 1900. (2126)</p>	<p>usually known as day biter but caught quite frequently at night. (2129)</p>

* Major Vector

Table 4 cont.

WESTERN SAMOA — MOSQUITO DATA

	ROLE	HABITAT	BREEDING	BITING	REMARKS
* <i>Aedes pseudoscutellaris</i>	major vector. (2086)	rests in grass vines under brush beneath houses near breeding place. (2086)	any small water collection except ground puddles. (2086)	throughout the day in any area with peaks in the shade and at dawn and dusk. night biter. (2086)	wind shifted the distribution of infected mosquitoes to the leeward side of each village. (2086)
* <i>Aedes samoanus</i>	very important vector. (2015) major vector. (2042)	primarily outdoor resters. truly forest or bush mosquito. present in some villages where the virgin forest borders the village. (2020) found resting in houses at night and in early morning. (2042) no correlation with temperature or relative humidity. some possible relation to rainfall. no density differences in indoor or outdoor collections. (2100)	leaf axils of freycinetia species and pandanus. (2020) leaf axils of freycinetia and common pandanus. (2042) pandanus. (2126) pandanus trees. (2128) motor car tires, drums, pandanus, freycinetia. larvae present in every village of Upolu in leaf axils of pandanus. larvae present only in eastern and southern parts of Savai'i in leaf axils of pandanus. breeds more abundantly in higher axils than in lower ones. breeds more in inland areas than in coastal areas. inland areas slightly elevated. only larvae present in freycinetia. (2129)	nocturnal peak at 2300. feeds readily on man. bites by day (2020) night biter with peak at 2300. (2042) peak from midnight to 0330. no correlation with temperature or relative humidity. some possible relation to rainfall. (2100) night biter. (2086) night biter. (2126) night biter. (2129)	exceedingly abundant nocturnal species in interior villages and in some coastal villages closely surrounded by bush. transmission occurs in open village. (2020) seasonal variation correlates mostly with rainfall. (2100) restricted to certain villages. rarely present in urbanized areas. (2126) seasonal peak density = May. seasonal low density = September. density seems to be correlative to the amount of rainfall in a whole month period from 2 months before to 1 month before survey. (2128) population density highest between 2100 and 0400 with highest peak between 2400 and 0300. (2129)

* Major Vector

Table 4 cont.

WESTERN SAMOA — MOSQUITO DATA

	ROLE	HABITAT	BREEDING	BITING	REMARKS
<i>Aedes</i> <i>upolensis</i>	minor vector. (2042)	bush. (2015) truly forest or bush mosquito. occurs in some villages where the virgin forest borders the village. (2020)	fallen tree stumps, fern tree stumps in deep forest. (2042)	feeds readily on man. bites by day. (2015)	restricted in distribution and abundance. may play important part in transmission in some interior and coastal villages closely surrounded by bush and in some bush plantations. (2015) restricted to Samoan Islands. (2020)
<i>Aedes</i> <i>aegypti</i>	of no importance in transmission (2126)	no infection has ever been found in this mosquito. (2129)	drums. larvae present even in remote areas and even in clean water.		additional sources: 2033, 2086, 2101.
<i>Aedes</i> <i>nocturnus</i>					source: 2020.
<i>Aedes</i> <i>oceanicus</i>		no infection has ever been found in this mosquito. (2129)	pandanus. (2126) pandanus trees, giant taro. (2128)	night biter. (2129)	wide ranging. (2015) additional sources: 2020, 2101.
			pandanus, taro, giant taro, pineapple. larvae present in every village of Upolu in leaf axils of pandanus. (2129)		52

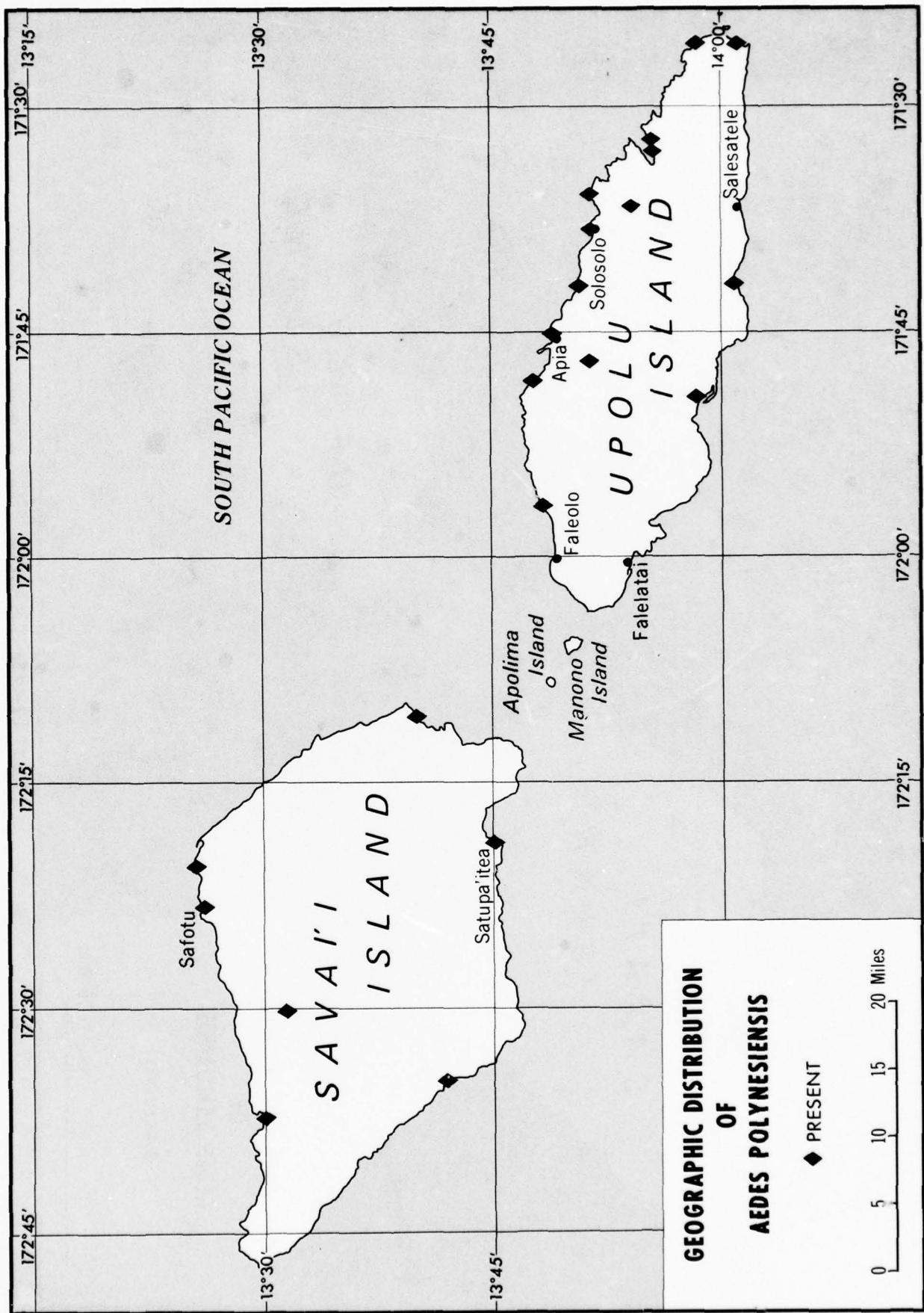
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WESTERN SAMOA — MOSQUITO DATA

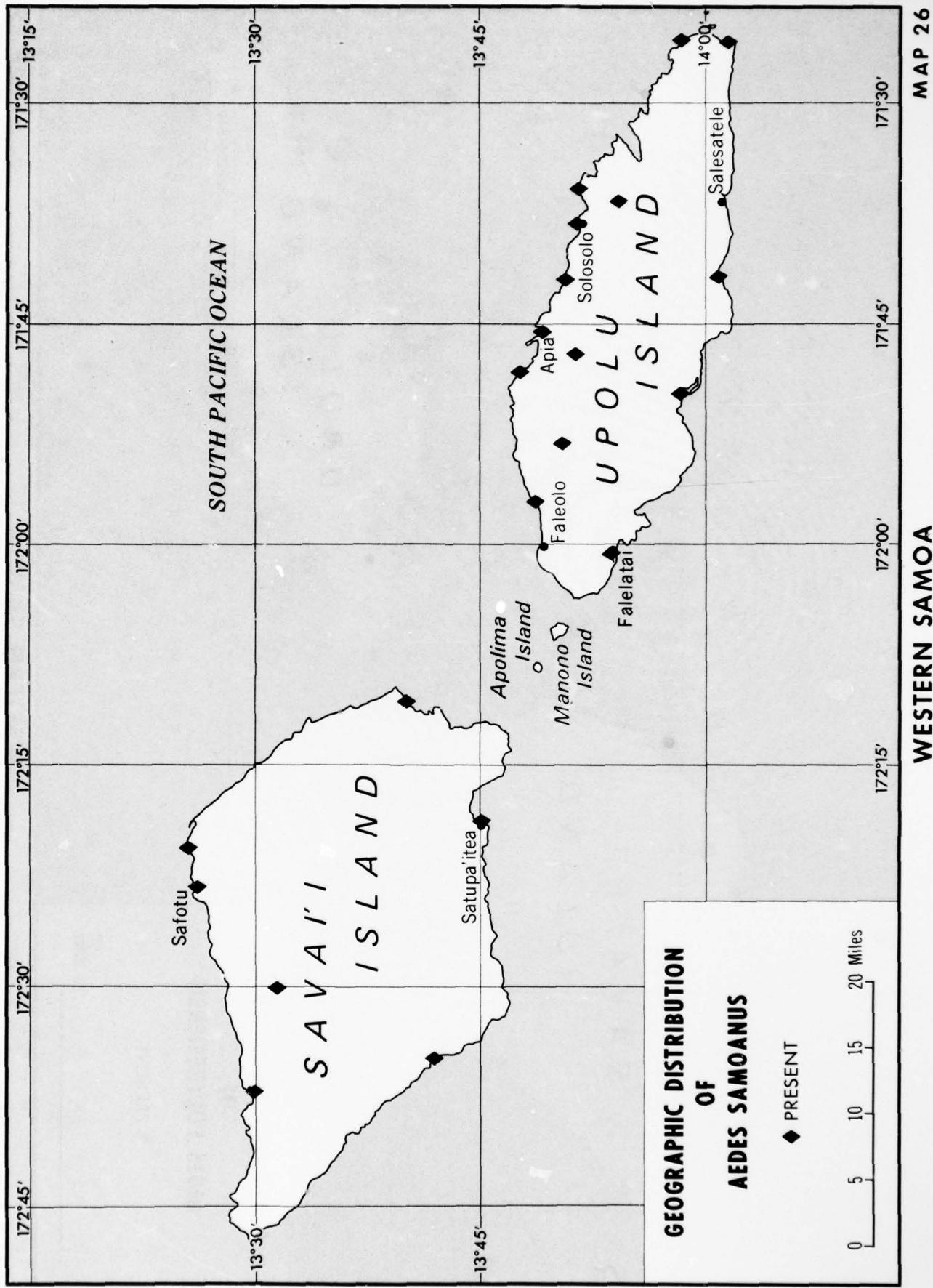
	ROLE	HABITAT	BREEDING	BITING	REMARKS
<i>Aedes tutuilae</i>	no infection has ever been found in this mosquito. (2129)	verandah of school building, Samoan "fale," grassy ground under a tree. (2128)	exclusively in pandanus leaf axils from sea level to 1500 feet. (2020) pandanus. (2127) pandanus trees. (2128)		only reported in the Samoas. (2020) density seems to be correlative to the amount of rainfall in a whole month period from 2 months before to 1 month before the survey. (2128)
<i>Aedes vexans</i>					source: 2086.
<i>Culex annulirostris</i>					sources: 2020, 2086.
<i>Culex fatigans</i>	of no importance in transmission. (2126)	verandah of school building, Samoan "fale," outside on the grassy ground under a tree, resting— present in shaded areas, absent in unshaded areas. (2128)	pit latrines. (2126), tree holes, drums, coconut shells, ditch, swamp. (2128)	night feeder. (2100) night biter. (2126) night biter. (2129)	mainly present in urbanized areas. (2126) additional sources: 2020, 2101, 2086.
					53

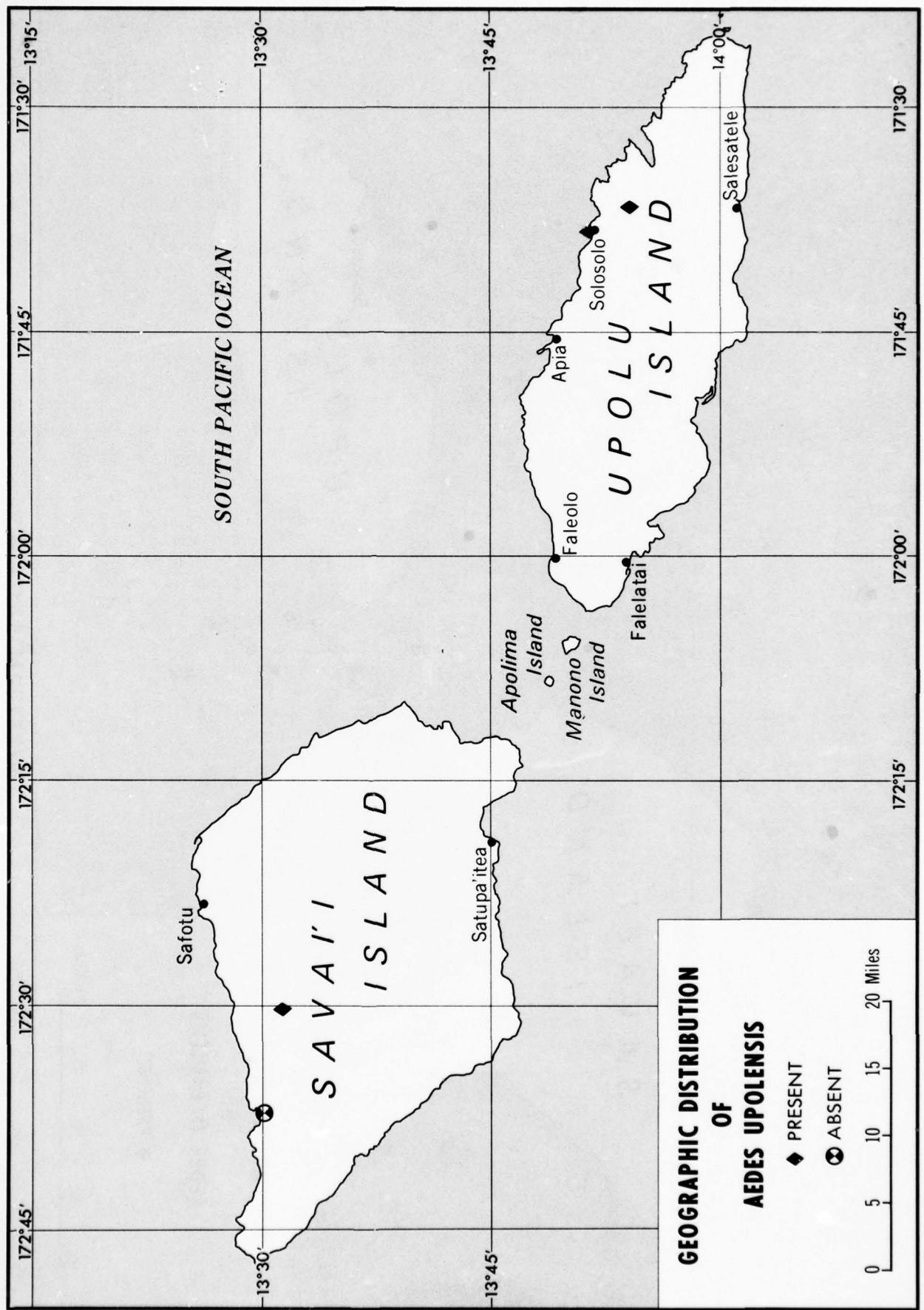
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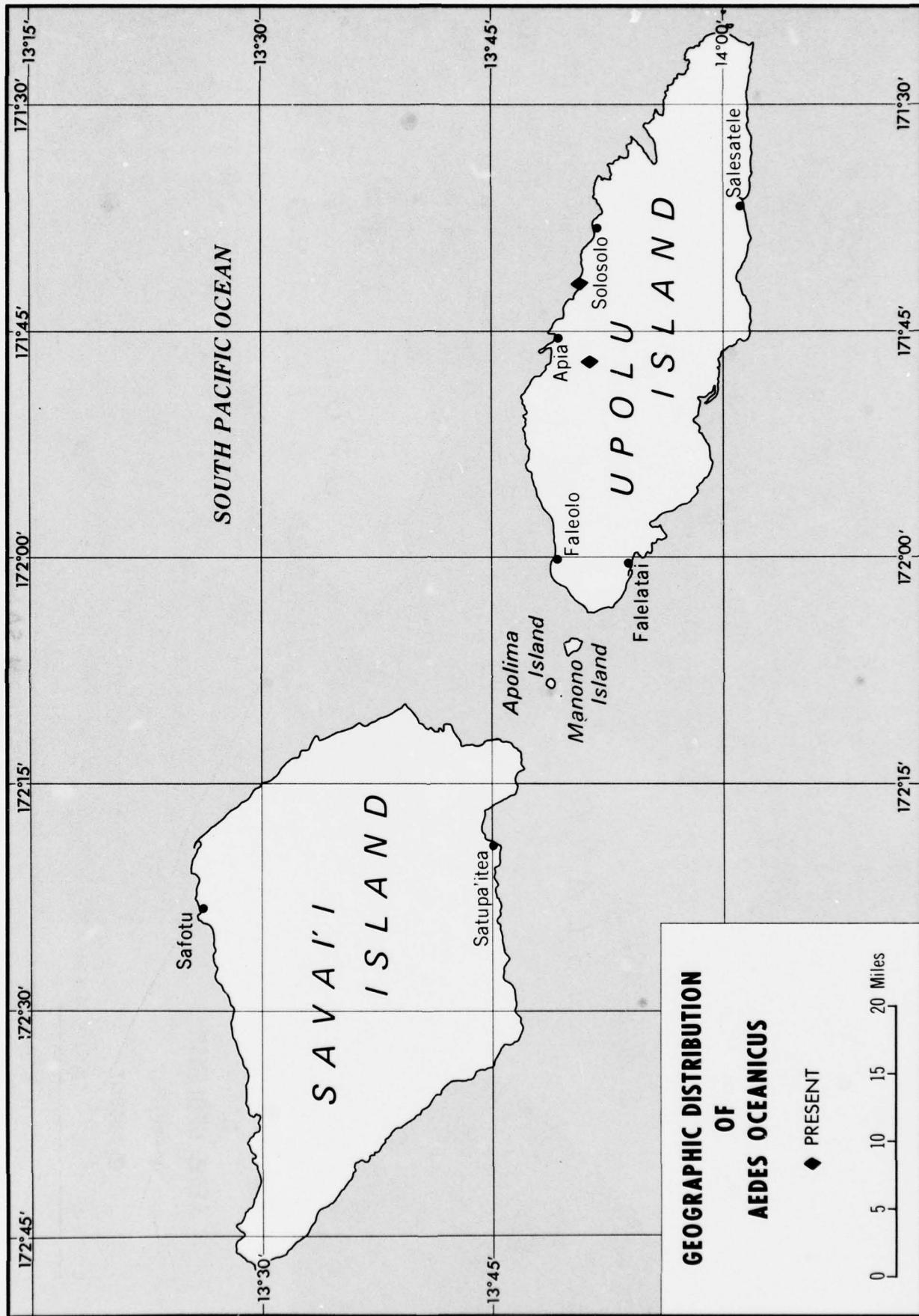
WESTERN SAMOA — MOSQUITO DATA

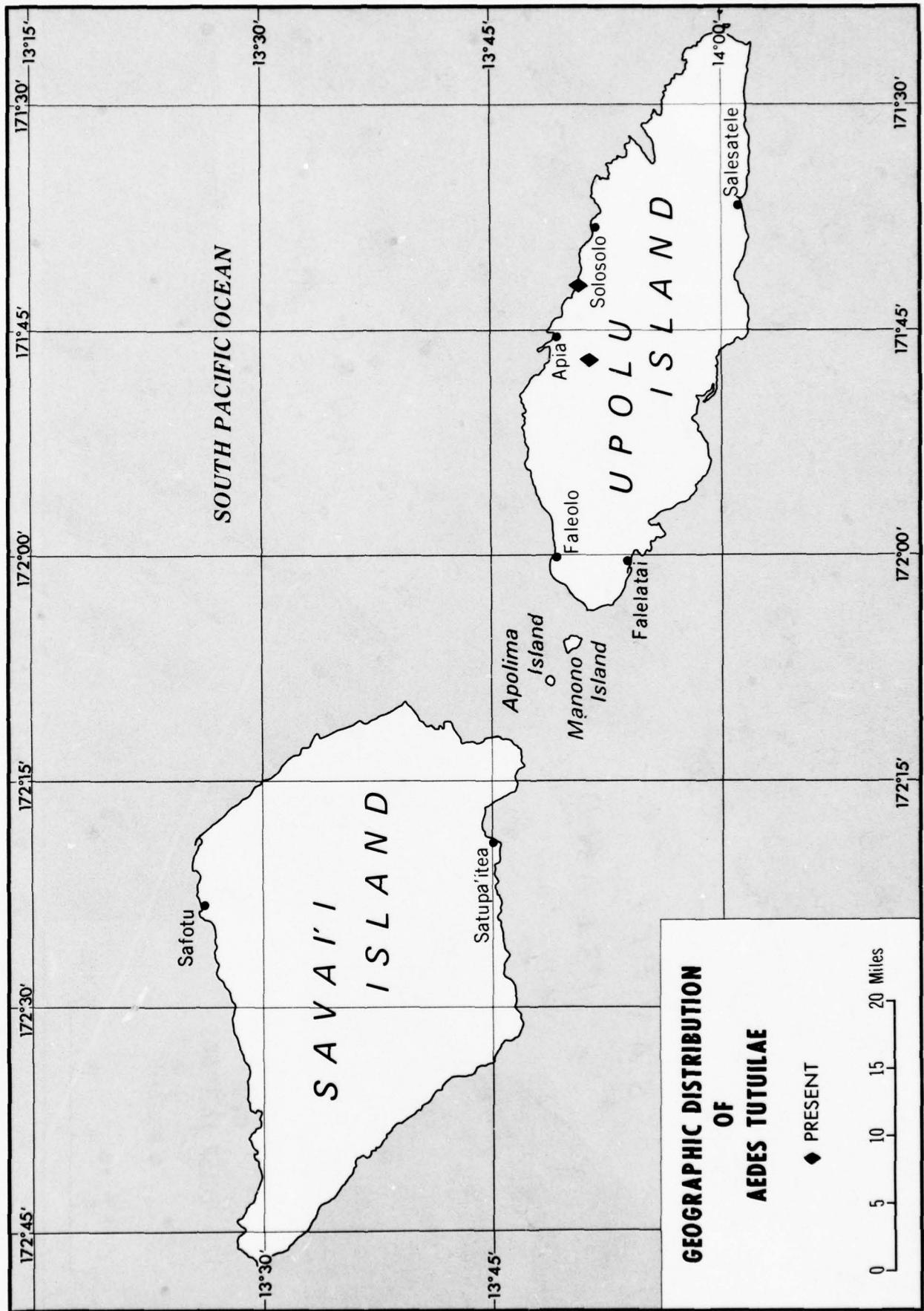
	ROLE	HABITAT	BREEDING	BITING	REMARKS
<i>Culex</i> <i>sitiens</i>			rock holes. (2127)		
<i>Toxorhynchites</i> <i>brevipalpis</i>			tree holes. (2127)		

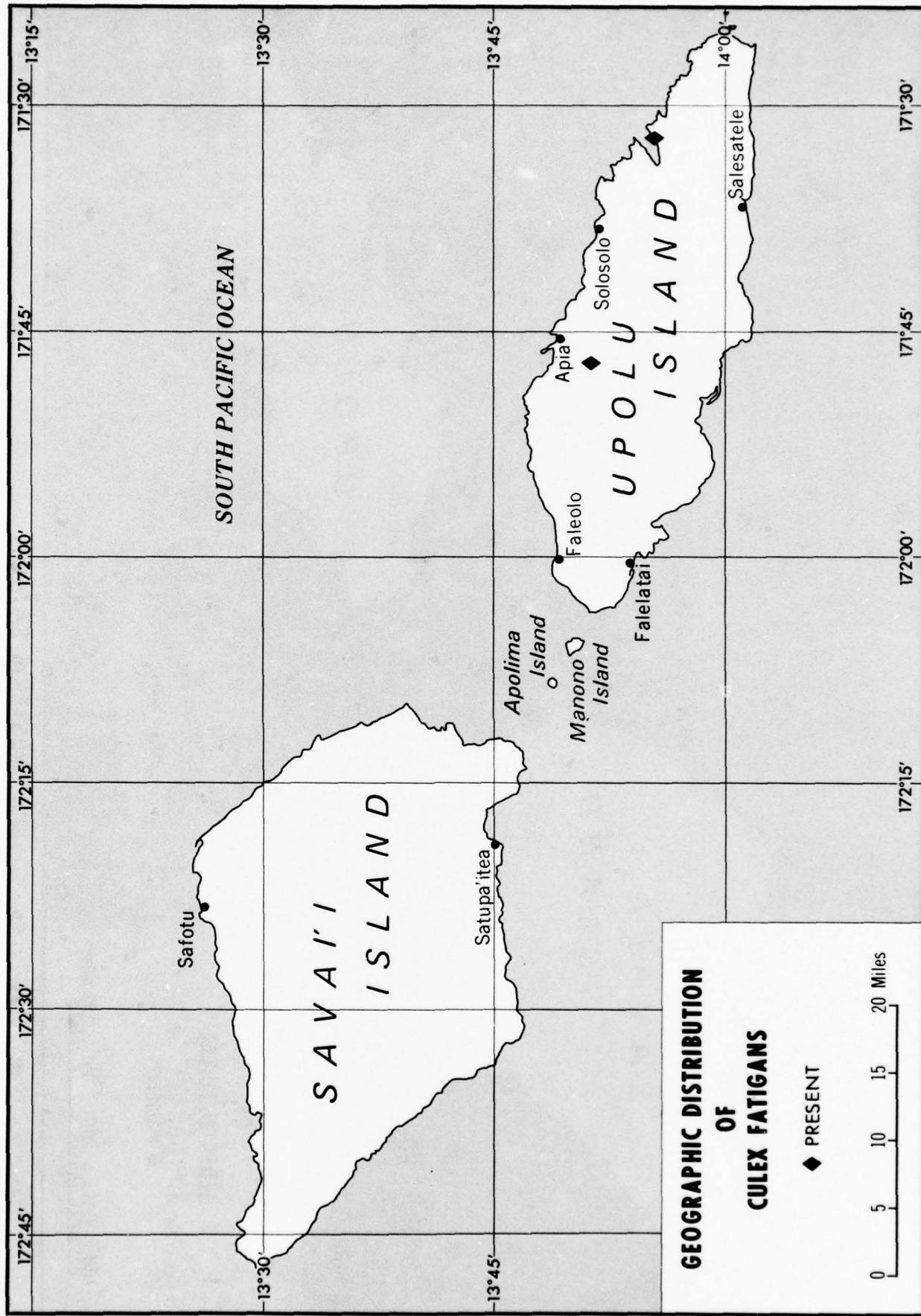












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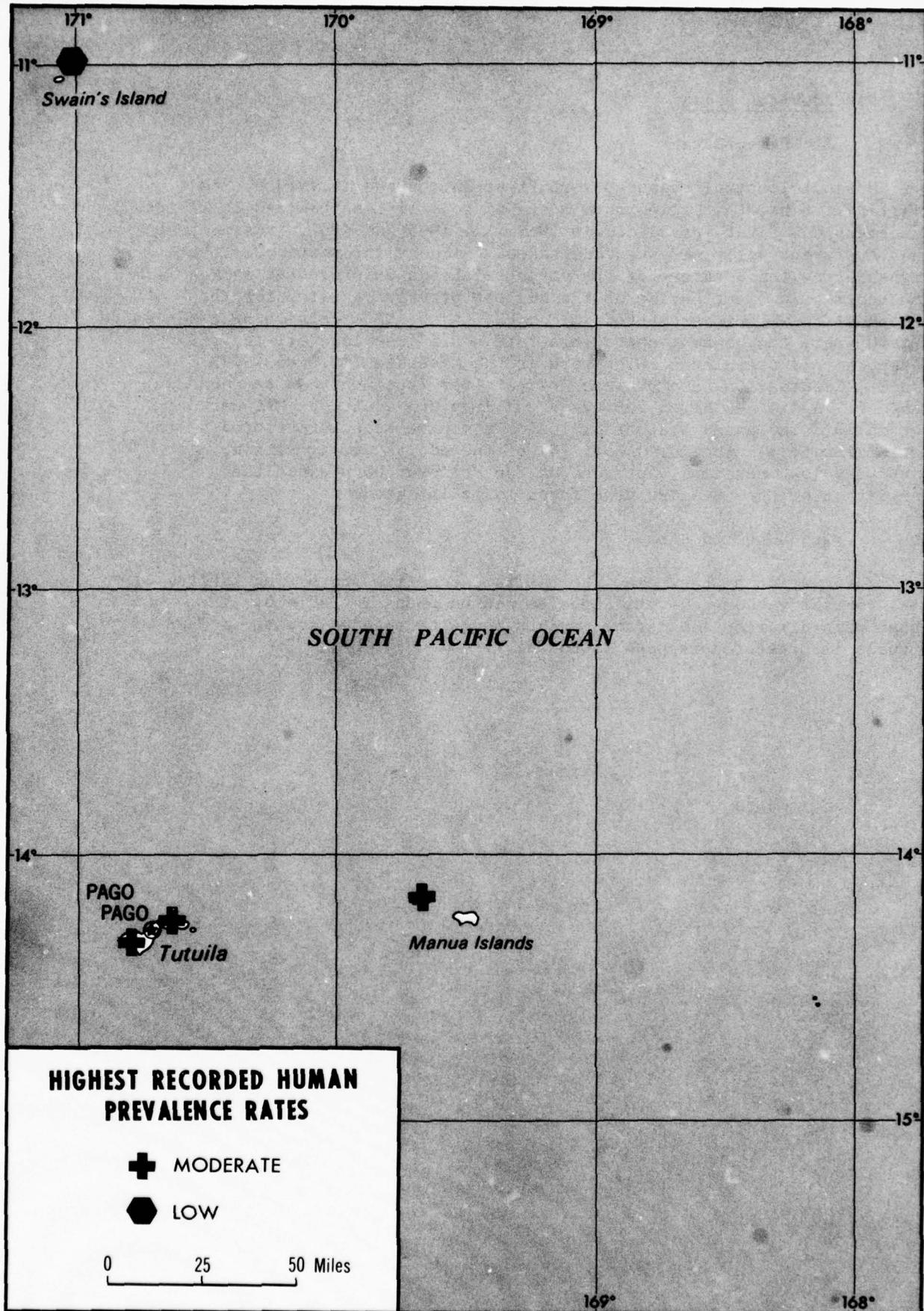
D. American Samoa

1. Human Data

Mosquito control measures were first introduced in 1943 by the military. Since that time, some means of control has remained in effect. Treatment was first introduced in 1963. In 1965 and 1967, treatment of the persistent positives was undertaken. Summary information of the highest prevalence rates for the various islands is presented in Map 31. The geographic distribution of the highest prevalence rates for the island of Tutuila is presented in Map 32. With the exception of Swain's Island where the highest prevalence rate was in the low (0.1 to 9.9%) category, all prevalence rates were in the moderate (10.0 to 49.9%) range. Information on prevalence rates after treatment can be found in Table 5. A limited blood survey of children and adults by MFC carried out in 1973 indicated that transmission may have been interrupted by the anti-filariasis campaign. About 10% of the adults were positive, most with very low densities, but none of the children born since the initiation of the campaign were found to be infected.

2. Mosquito Data

Information on the role, the habitat, breeding and biting habits, etc. for the various mosquito species can be found in Table 6. The geographic distribution of the various mosquito species for the island of Tutuila is presented in Maps 33 to 35.



AMERICAN SAMOA

MAP 31

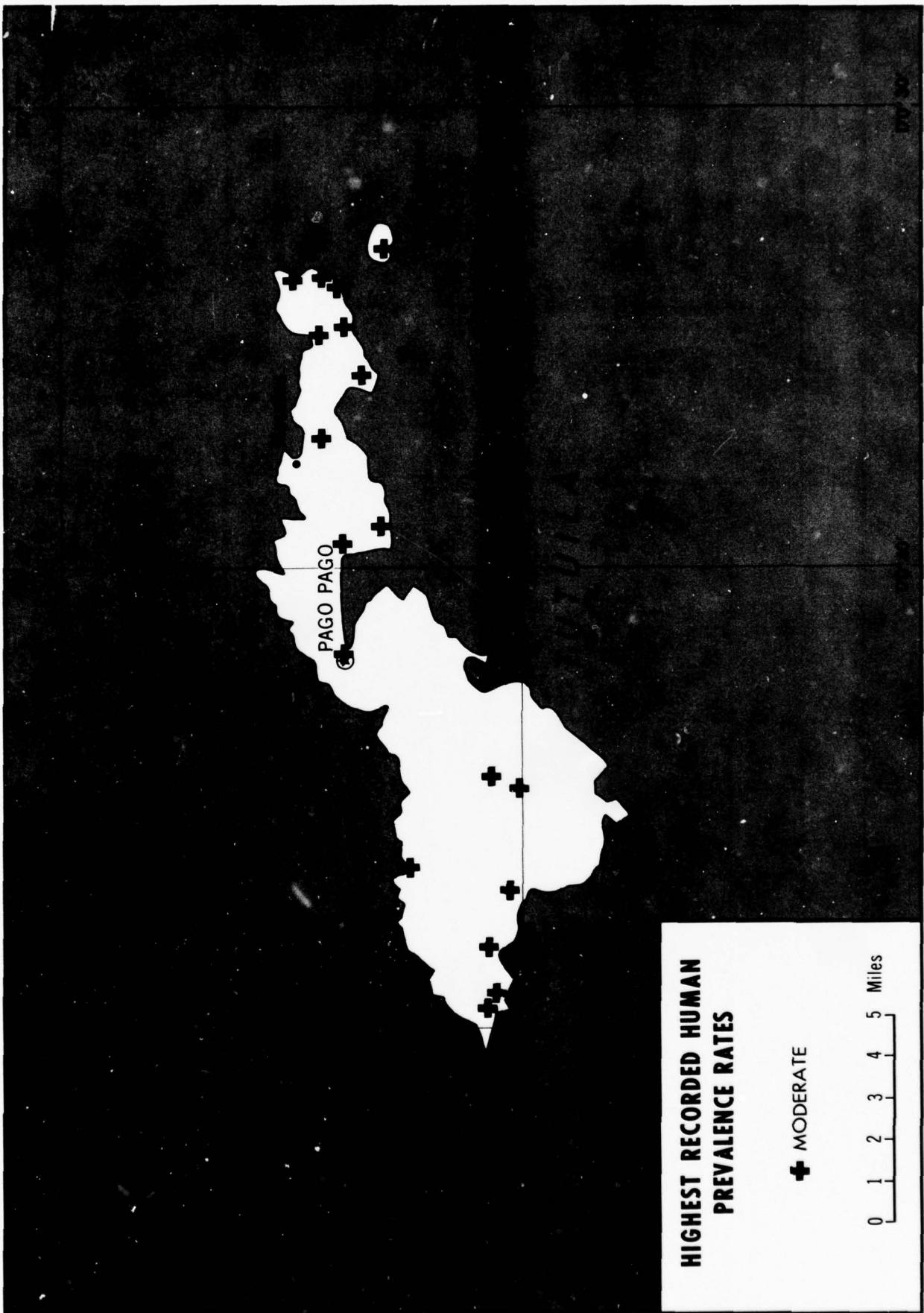


Table 5

AMERICAN SAMOA — MOST RECENT PREVALENCE RATES

LOCATION	DATE	MATERIAL	METHODS	PREVALENCE	TREATMENT INFORMATION
AMERICAN SAMOA (2018)	1965 to 1966	capillary blood	20 cmm smear	7.4%	post control
TUTUILA (2018)	1967	capillary blood	20 cmm smear	0.4%	2 years after second mass treatment
Aloa (2018)	1965	capillary blood	20 cmm smear	0.0%	2 years after second mass treatment
Alofau (2018)	1967	capillary blood	20 cmm smear	0.7%	2 years after second mass treatment
Amanave (2018)	1967 to 1968	capillary blood	40 cmm (2x20) smear	0.8%	after second mass treatment
Amouli (2018)	1967 to 1968	capillary blood	40 cmm (2x20) smear	0.0%	after second mass treatment
Malaeao (2018)	1967 to 1968	capillary blood	40 cmm (2x20) smear	9.2%	did not receive second mass treatment
Onenoa (2018)	1965	capillary blood	20 cmm smear	0.0%	2 years after second mass treatment
Tula (2018)	1967	capillary blood	20 cmm smear	0.4%	2 years after second mass treatment
Utumea (2018)	1967	capillary blood	20 cmm smear	1.0%	2 years after second mass treatment

Table 6
AMERICAN SAMOA — MOSQUITO DATA

	ROLE	HABITAT	BREEDING	BITING	REMARKS
* <i>Aedes polynesiensis</i>	important vector. (2012) non-periodic vector. (2036)	density consistently and significantly greater in undergrowth than in villages. rest on leaf underside near breeding containers and in rock wall cracks. not found resting inside houses. (2013)	broken crockery bottles, tree holes, coconut shells. (2041) containers just above the water line in well shaded areas. coconut shells most frequent. (2013)	lesser biting peak in morning, greater biting peak in afternoon some night biting indoors and out. mainly man but also pigs, horses, dogs and probably birds. (2020)	no seasonal variation in density. flight range = less than 100 yards. mean survival = 21.2 days. apparently requires blood meal for oviposition. (2013) dispersal less than 100 yards. (2020) additional source: 2032.
		coconut and banana groves. scarce in villages. (2041) rest in dry tree holes, partially detached bark, underside of leaves and dry coconut husks. places sheltered from the wind but not inside houses. (2020)	tree holes, rock holes, crab holes, coconut shells, large and small artificial containers, pandanus leaf axils, banana leaves, banana stumps, ground pools, cacao pods. (2020)	man seems to be preferred host. (2013)	wind shifted the distribution of the infected mosquito to the leeward side of each village. (2086) widely distributed with diurnal habits. (2011)
* <i>Aedes pseudoscutellaris</i>	major vector. (2086) important vector. (2011)	associated more with wild or natural cover than with artificial or domestic cover. (2011) rests in grass vines beneath houses near breeding place. (2086)	tin cans, coconut shells, tree rot holes, rain water barrels, troughs and cisterns, all shaded. rarely breeds in direct sunlight. eggs laid on moist area just above water level. (2030) any small water collection except ground puddles. (2086)	does not enter center village green to bite. (2030) throughout the day in any area with peak in the shade and at dawn and dusk. night biter. (2086)	feeds by preference during cooler hours after daybreak and before sunset rather than in midday heat. (2011)

* Major Vector

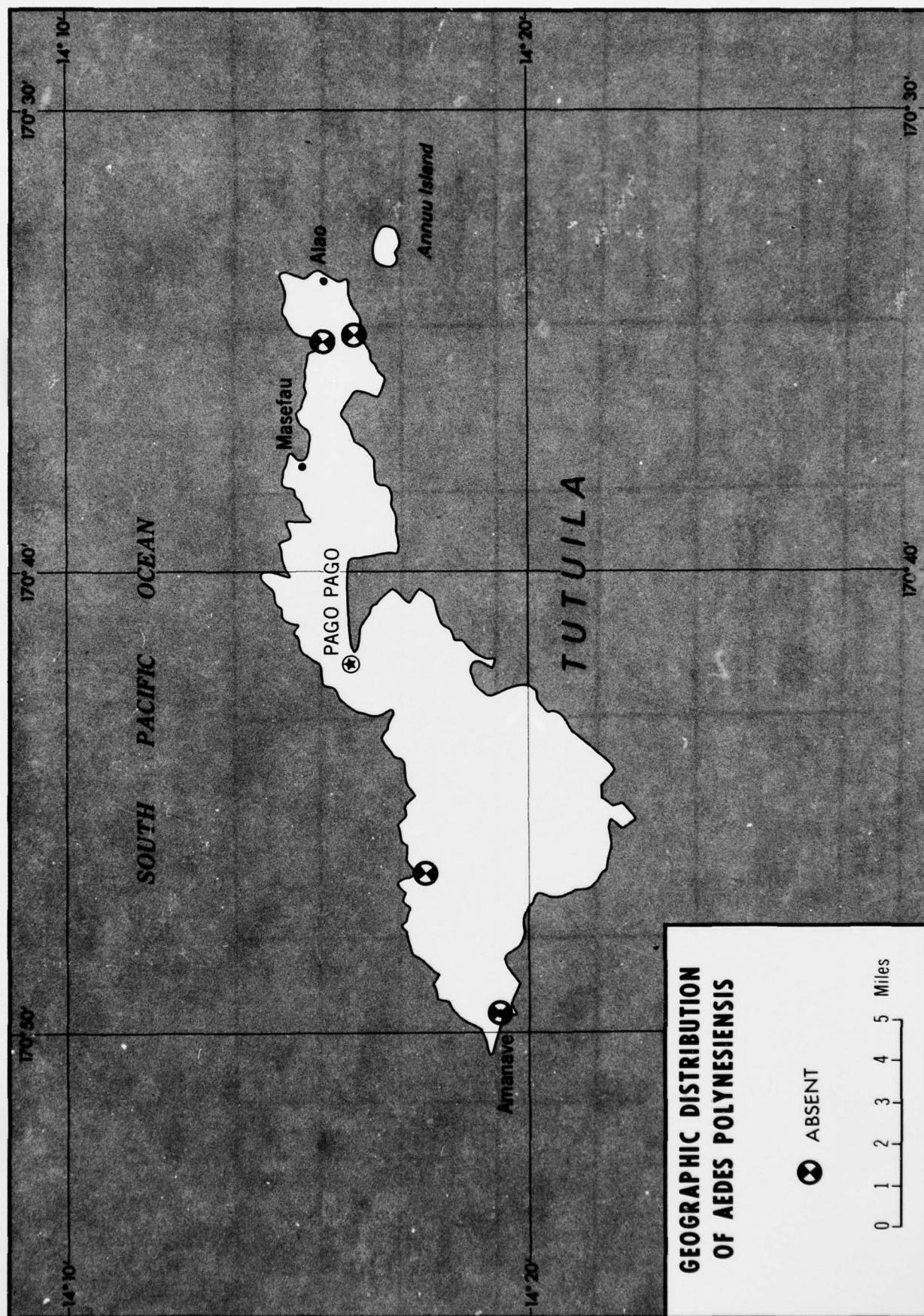
Table 6 cont.

AMERICAN SAMOA — MOSQUITO DATA

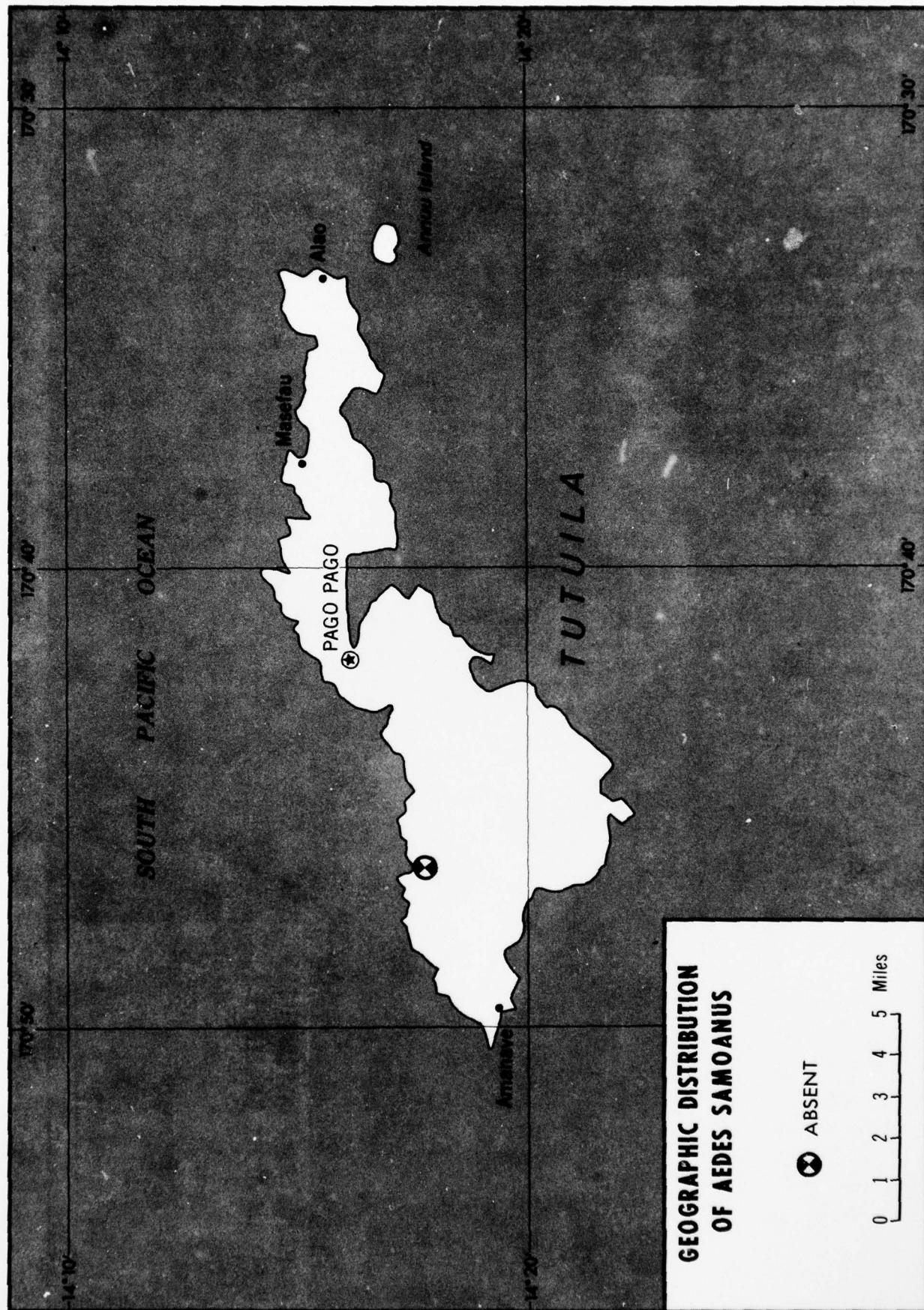
	ROLE	HABITAT	BREEDING	BITING	REMARKS
* <i>Aedes pseudoscutellaris</i> (cont.)				feeder at twilight and dusk or any hour in shade or under clouds. noiseless flight immediate feeding upon alighting. almost painless bite. (2030)	
* <i>Aedes samoanus</i>	major vector. (2042) very important vector. (2015)	truly forest or bush mosquito. occurs in some villages where the virgin forest borders the village. (2020)	leaf axils of forest creeper, <i>freycinetia</i> sp., which occurs only in native jungle and bush. does not breed in <i>pandanus</i> in Tutuila. (2020)	feeds readily on man. bites by day. (2020) night biter with peak at 2300. (2042)	exceedingly abundant nocturnal species in interior villages and in some coastal villages closely surrounded by bush. (2015)
		found resting in houses at night and in the early m morning. (2042)	leaf axils of <i>freycinetia</i> and common <i>pandanus</i> . (2042)	night biter. (2086)	interior villages and coastal villages near bush due to, primarily breeding requirements of forest creeper. (2020)
					not involved in open village transmission. (2042)
<i>Aedes variegatus</i>	vector. (2085)		natural and artificial containers. (2085)	dim light biter. (2085)	
<i>Aedes upolensis</i>	minor vector. (2042)	bush. (2015)	fallen tree stumps, fern [‡] see stumps in deep forest. (2042)	feeds readily on man bites by day. (2020)	restricted in distribution and abundance. may play important part in transmission in some interior and coastal villages closely surrounded by bush and in some bush plantations. (2015)
		truly forest or bush mosquito. occurs in some villages where the virgin forest borders in villages. (2020)			restricted to the Samoan Islands. (2020)
* Major Vector					70

AMERICAN SAMOA — MOSQUITO DATA

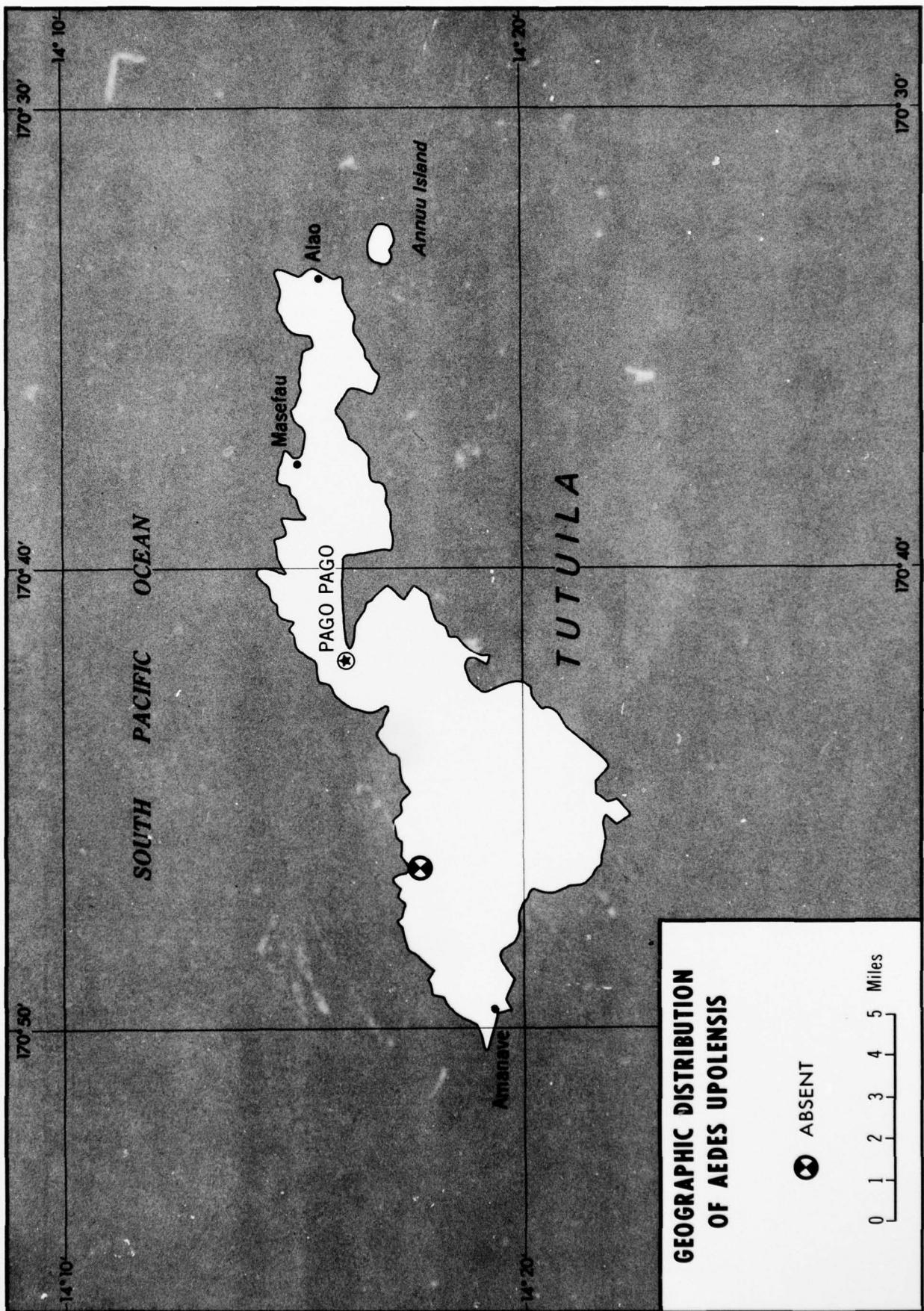
	ROLE	HABITAT	BREEDING	BITING	REMARKS
<i>Aedes tutuilae</i>	suspected vector. (2042)		common pandanus. (2042)		only reported in Samoas. (2020)
<i>Aedes aegypti</i>			exclusively in pandanus leaf axils from sea level to 1500 feet. (2020)		
<i>Aedes oceanicus</i>					
<i>Aedes vexans</i>					
<i>Culex annulirostris</i>					
<i>Culex fatigans</i>					



AMERICAN SAMOA



AMERICAN SAMOA



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<u>Document Number</u>	<u>Source</u>
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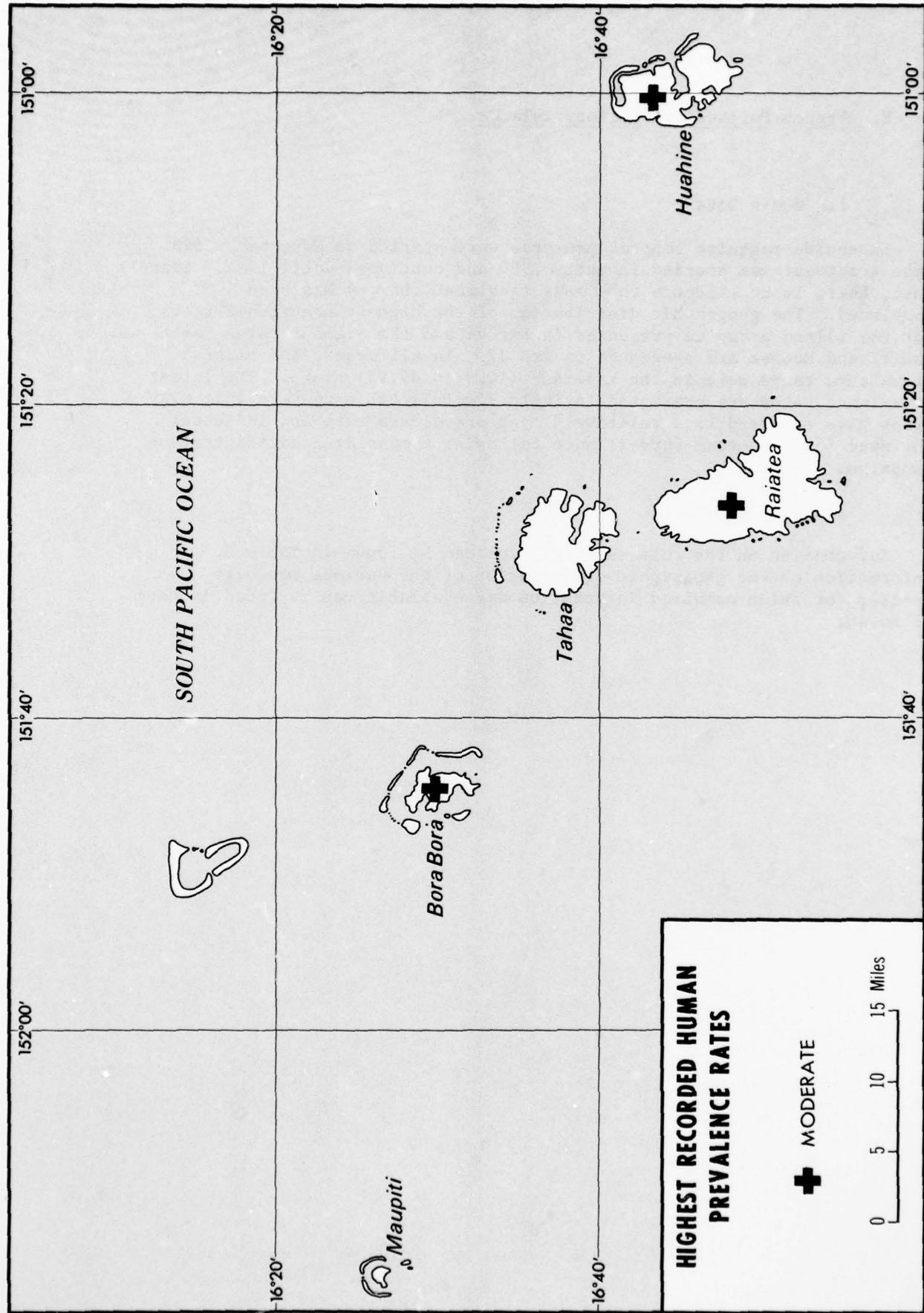
E. French Polynesia: Society Islands

1. Human Data

Extensive mosquito control measures were started in November, 1948. Mass treatment was started in early 1950 and continued until 1954. Since then, there is no evidence that mass treatment therapy has been continued. The geographic distribution of the highest prevalence rates for the island group is presented in Map 36 and the highest rates for Tahiti and Moorea are presented in Map 37. In all cases, the highest prevalence rates were in the moderate (10.0 to 49.9%) range. The latest prevalence rates are presented in Table 7. This table reveals that many areas have reverted to a relatively high prevalence rate and indicates the need for long-term surveillance following a mass drug administration campaign.

2. Mosquito Data

Information on the role and bionomics can be found in Table 8. Information on the geographic distribution of the various mosquito species for which detailed information was available can be found in Maps 38 to 40.



SOCIETY ISLANDS

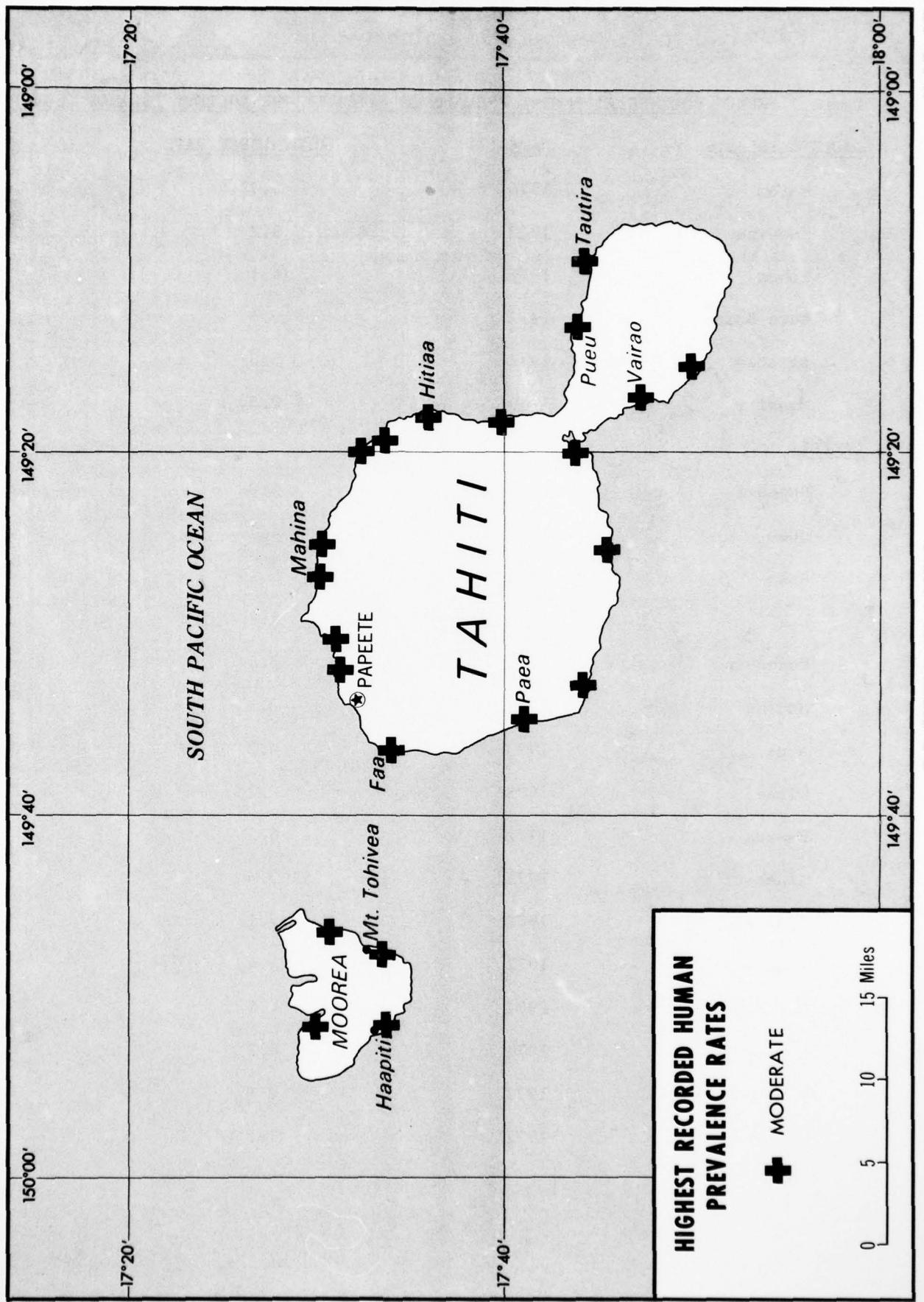


Table 7 FRENCH POLYNESIA: RECENT PREVALENCE RATES IN THE SOCIETY ISLANDS (2139)

<u>SOCIETY ISLANDS</u>	<u>DATE</u>	<u>PREVALENCE RATE</u>
Maiao	1974	6.7%
Huahine	1972	6.2
Tahaa	1972	14.1
Bora Bora	1972	3.4
Raiatea	1971	5.0
Maupiti	1969	0.8
<u>TAHITI</u>		
Papeari	1974	5.8
Pueu	1974	4.7
Paea	1974	5.1
Faa	1973	5.2
Punaavia	1973	3.5
Mahina	1973	3.1
Arue	1973	4.2
Pirae	1973	2.2
Papara	1972	6.2
Afaahiti	1972	3.4
Tohautu	1972	7.1
Faaone	1972	5.4
Maraiea	1971	4.5
Vairo	1971	6.3
Teahupoo	1971	2.8
Tautira	1971	1.8

Table 7 Con't

Hitiaa	1971	2.9
Mahaena	1971	3.1
Tiarei	1971	2.1

MOOREA

Paopao	1974	1.5%
Haapiti	1974	1.8
Papetoai	1973	0.3
Teavaro	1973	2.6
Afareaitu	1973	1.1

Table 8
FRENCH POLYNESIA: SOCIETY ISLANDS — MOSQUITO DATA

	ROLE	HABITAT	BREEDING	BITING	REMARKS
* <i>Aedes polynesiensis</i>	forest dwelling, does not rest inside houses. (2057)	tree holes, coconuts, rock holes, crab holes, pirogues, metal drums, barrels. (2057)	numerous in larva rock from upper wet regions to drier coastal regions. coconut, breadfruit and banana leaves especially in uncleared overgrown areas. rat-eaten coconuts, tree holes, cut bamboo stumps, crab holes, cisterns, rain barrels, tubs, drums, bottles, tin cans, auto tires, machinery, stored junk, canoes, animal waterers and ant guards. (2049)	only occasionally enters houses to bite. bites man, pigs, dogs, rats, and birds. (2057) daytime very aggressive reluctant to stop short of repletion on humans. (2033)	eggs resist drying. (2057) short flight range. (2049) eggs are resistant to drying. present in dry canoes, dilute sea water beneficial to egg laying and development. eggs may remain in many dry locations for some time developing in subsequent rains. (2049) additional source: 2026.
* <i>Aedes pseudoscutellaris</i>					sources: 2035, 2064.
Aedes aegypti				day or night. (2033) primarily man. (2057)	abundant in urban areas, rare in rural areas. (2057)

* Major Vector

AD-A063 365

HAWAII UNIV HONOLULU DEPT OF TROPICAL MEDICINE AND M--ETC F/G 6/5
A BIOMETRIC STUDY OF FILARIASIS 'WUCHERERIA BANCROFTI' IN THE S--ETC(U)
JUN 76 R S DESOWITZ

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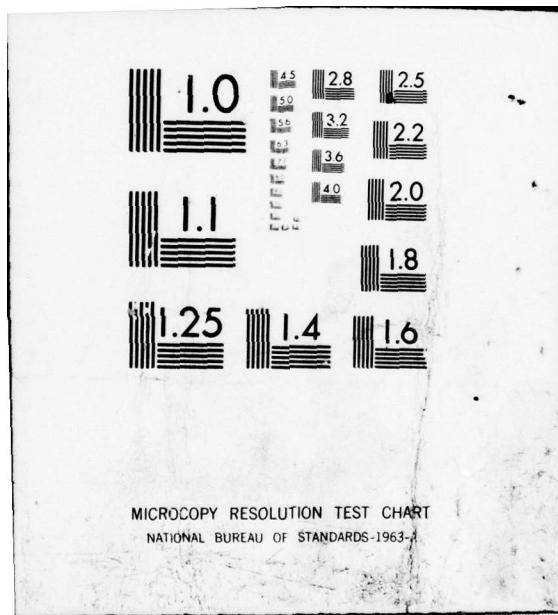
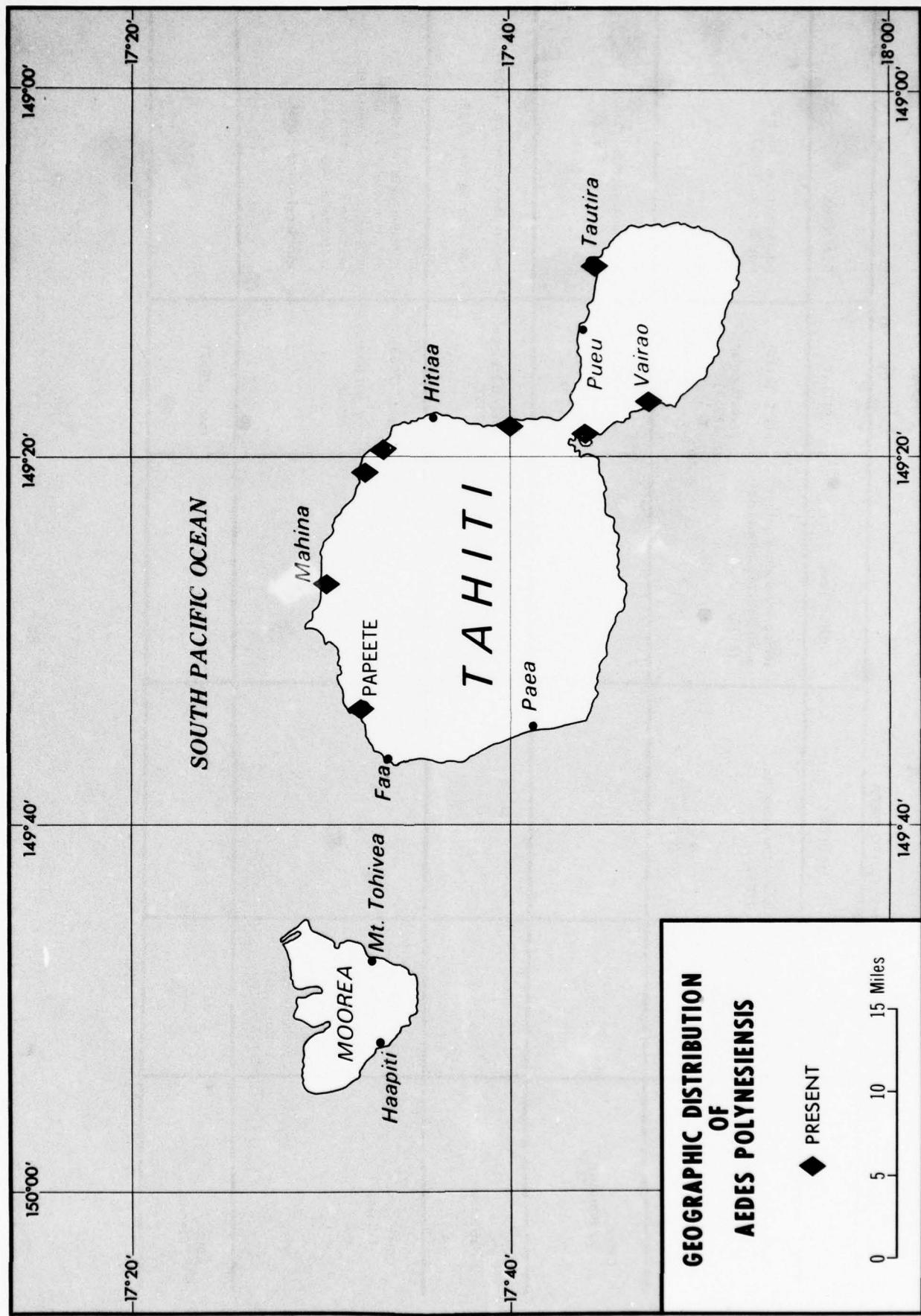
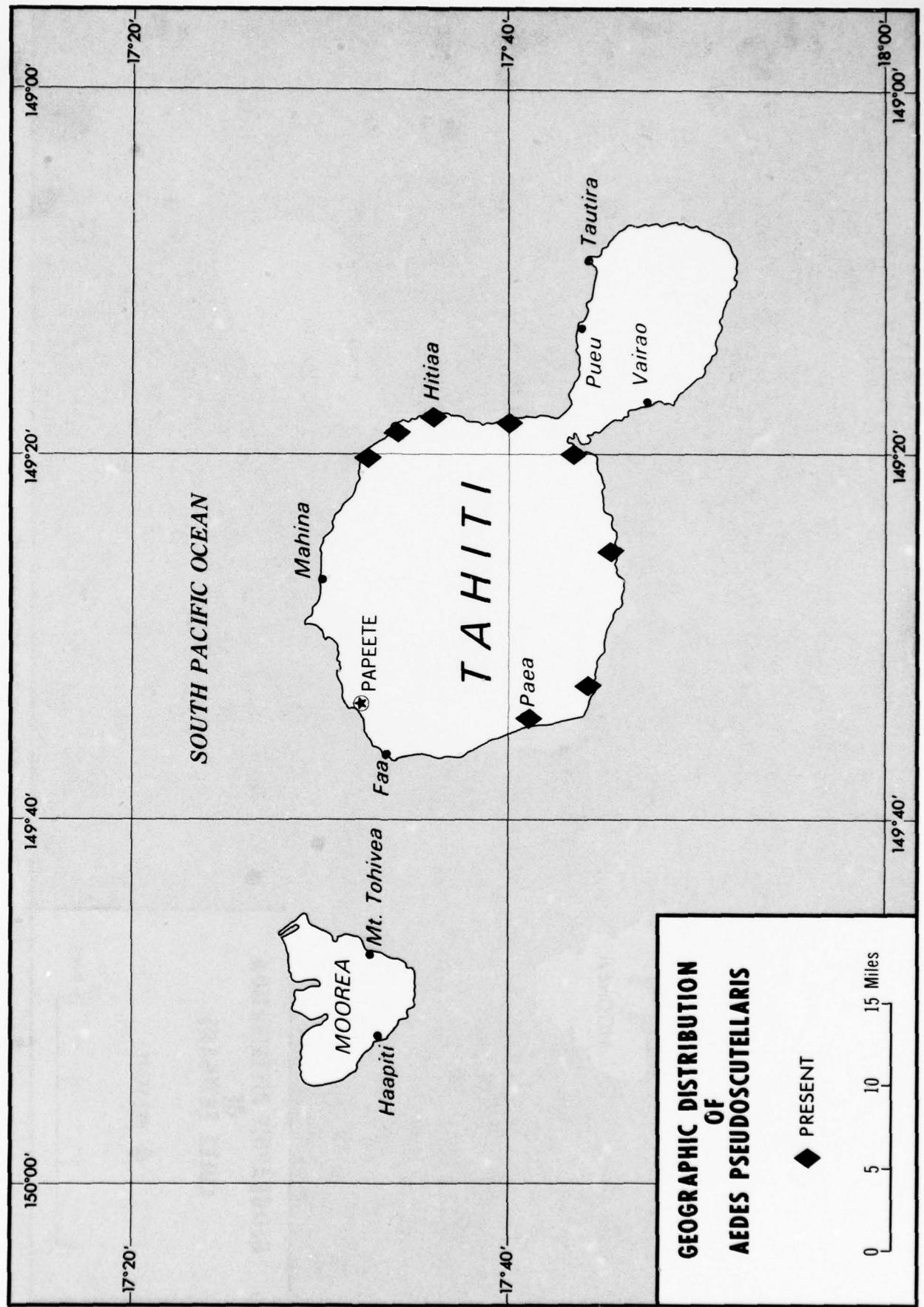


Table 8 cont.
FRENCH POLYNESIA: SOCIETY ISLANDS — MOSQUITO DATA

ROLE	HABITAT	BREEDING	BITING	REMARKS
<i>Aedes edgari</i>	flood water mosquito. (2057)	temporary shallow ground pools both shaded and open. (2118)	night. (2118) probably man. (2057)	population rate, spotty distribution. (2057)
<i>Culex annulirostris</i>			night. (2033) birds, dogs, man. (2057)	additional source: 2035.
<i>Culex atriceps</i>			rarely bites man. (2057)	population uncommon. (2057) additional source: 2033.
<i>Culex fatigans</i>			night. (2033) man and birds. (2057)	infectivity and third stage density not related to donor density, indicating individual mosquito is determinant of vector suitability. (2033)
<i>Culex littoralis</i>			man. (2057)	additional source: 2035.

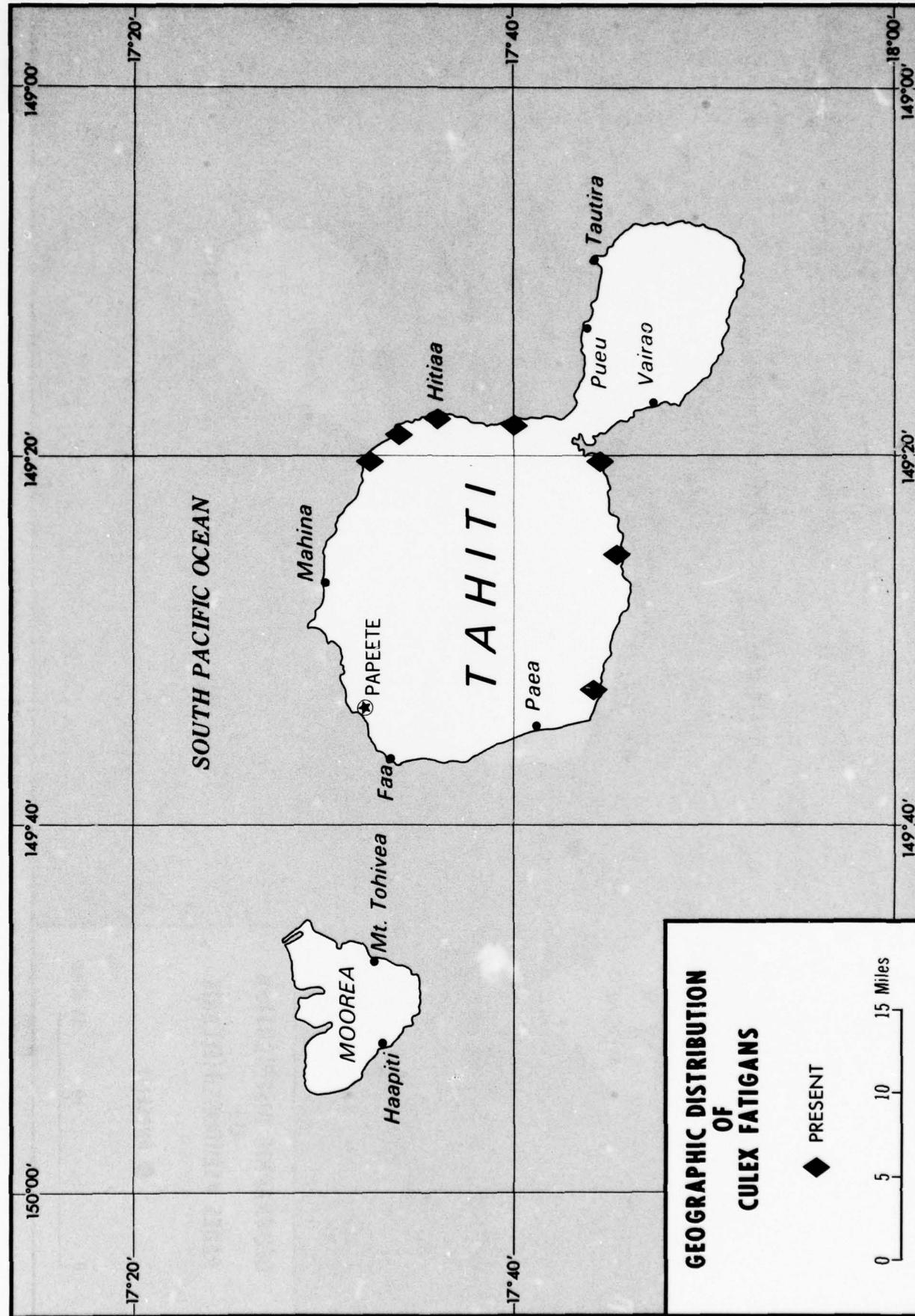


SOCIETY ISLANDS



MAP 39

SOCIETY ISLANDS



MAP 40
SOCIETY ISLANDS

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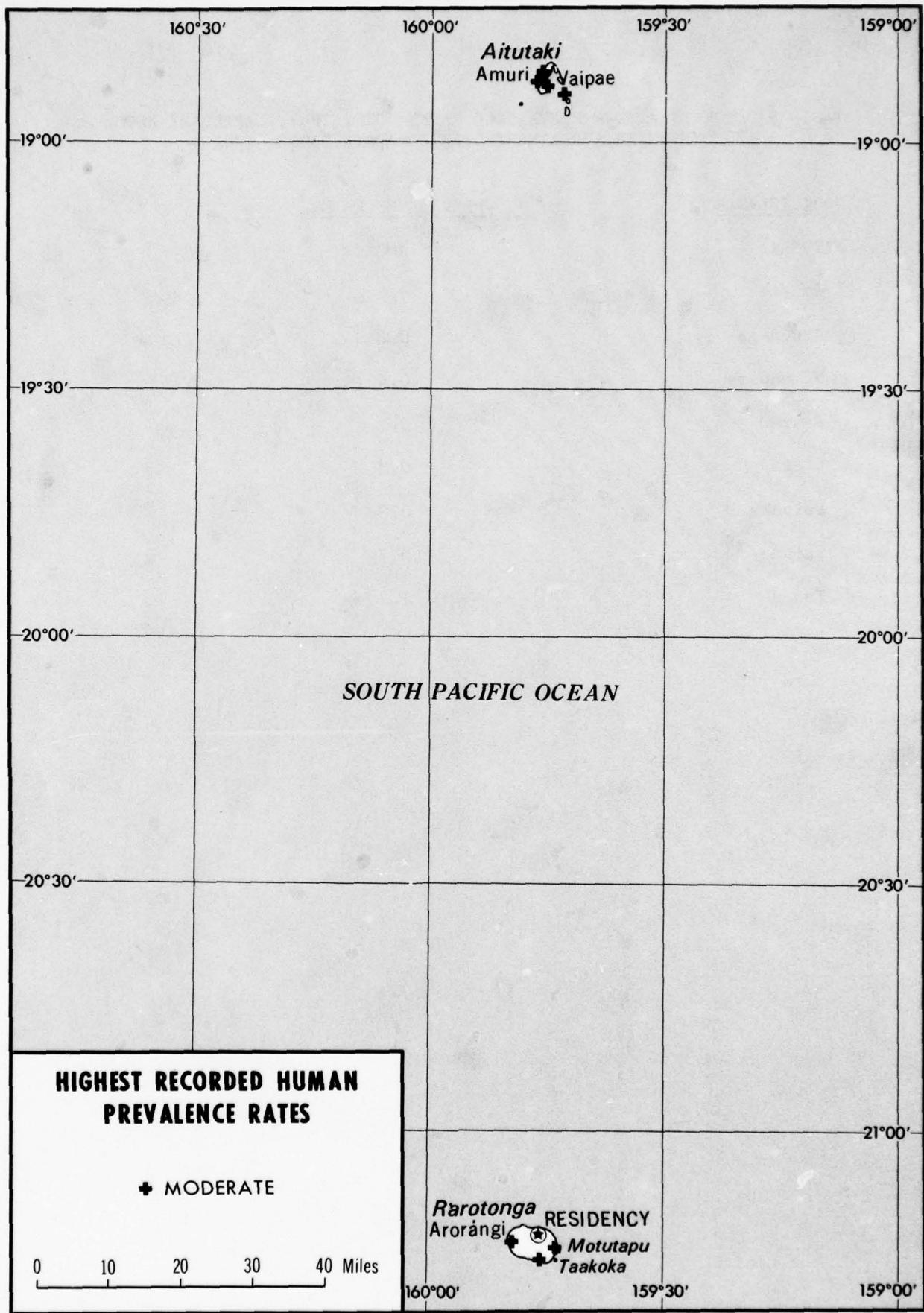
F. Cook Islands

1. Human Data

Mosquito control measures were started in 1945. They were directed primarily at villages and had little effect on the human prevalence rates. MDA was started in January, 1956, and the most recent treatment efforts were initiated in April, 1968. The highest prevalence rates for Aitutaki and Rarotonga are presented in Map 41. The most recent prevalence rates can be found in Table 9.

2. Mosquito Data

Information on the role and bionomics can be found in Table 10. No detailed information on the geographic distribution of the various mosquito species present on the Cook Islands was extracted into the Disease Information System. Therefore, maps could not be compiled.



COOK ISLANDS

MAP 41

Table 9 COOK ISLANDS - PREVALENCE RATES JUNE, 1969, CAPILLARY BLOOD
20 CMM SP'EAR, TREATMENT STARTED APRIL, 1968, (2023)

<u>COOK ISLANDS</u>	<u>PREVALENCE RATES</u>
AITUTAKI	0.8%
Amuri	0.5
Arutanga	0.8
Nikaupara	0.4
Reureu	2.1
Ureia	0.3
Vaipeka	0.8
Vaipae	0.7
Tautu	1.2

Table 10
COOK ISLANDS — MOSQUITO DATA

	ROLE	HABITAT	BREEDING	BITING	REMARKS
* <i>Aedes polynesiensis</i>	non-periodic vector. (2036) all stages parasites found. (2121)	highest densities near and inside habitation. (2121)	in order of importance -- rain water cisterns, water storage drums, coconut shells, rat damaged coconuts, ant guards, tree holes. (2121)	daylight hours in brush and inside houses. (2117)	highest infection rates near and inside habitation. (2121)
* <i>Aedes pseudoscutellaris</i>	complete larval development in 13 days. (2097)	heavy population in bush areas. resting place -- marked preference for damp places shaded by densely foliaged bushes. houses not used as resting places and mosquitoes enter only to feed. thick unkempt hedges are an important adult resting place. (2065)	small containers situated in fairly well shaded areas. artificial sites include: rusty tins, discarded coconut shells, empty bottles, jars, neglected roof gutters. natural sites include tree holes in the flamboyant tree, utu, wild hibiscus, puka and fallen leaves especially of the utu and wild hibiscus and fallen bracts of the coconut inflorescences. (2065)	associated with dull natural light -- dawn to 0800, 1600 to dusk. overcast days -- continues longer in morning and starts earlier in afternoon. very dull days -- biting may continue all day. no biting in full sunlight. light rain does not affect biting. heavy rainfall forces mosquito to remain in or return to resting place. (2065)	present throughout the islands where no control measures in effect. flight range -- healthy mosquito = maximum of 150 yards. fly against the breeze and seek shelter from strong winds. infected mosquito = maximum of 40 to 50 yards depending on the number of larvae present and stage of infection. (2065) April to November = population lowered probably due to insufficient rainfall to keep breeding sites effectively filled with water. December to March = marked rise in population due to sufficient rainfall to keep breeding sites filled with water. (2065) additional source: 2030.

* Major Vector

Table 10 cont.

COOK ISLANDS — MOSQUITO DATA

	ROLE	HABITAT	BREEDING	BITING	REMARKS
* <i>Aedes cooki</i>	suspected vector. (2042)	rain water containers, coconut shells, tins. (2042)			population high during summer months. (2042)
* <i>Aedes tongae</i>	assumed vector. (2053)	outdoor resting. (2053)			
<i>Culex annulirostris</i>	non-vector -- parasite larvae moribund or first stage only. (2121)		taro irrigation ditches, borron pits, swamps and beached canoes. (2117)	common at night. (2117)	additional source: 2030.
<i>Culex fatigans</i>	non-vector, all first stage or moribund parasite larvae. (2121)		steel tanks with organic debris, petrol drums and beached canoes. (2117)		additional sources: 2030, 2097.
<i>Culex sitiens</i>			small rock pools of brackish or saline water. breeding places restricted to cliffs overhanging the sea coast. (2053)		comparatively rare. (2053)
<i>Stegomyia fasciata</i>	arrested development of filaria. (2097)				population = large numbers. (2097)

* Major Vector

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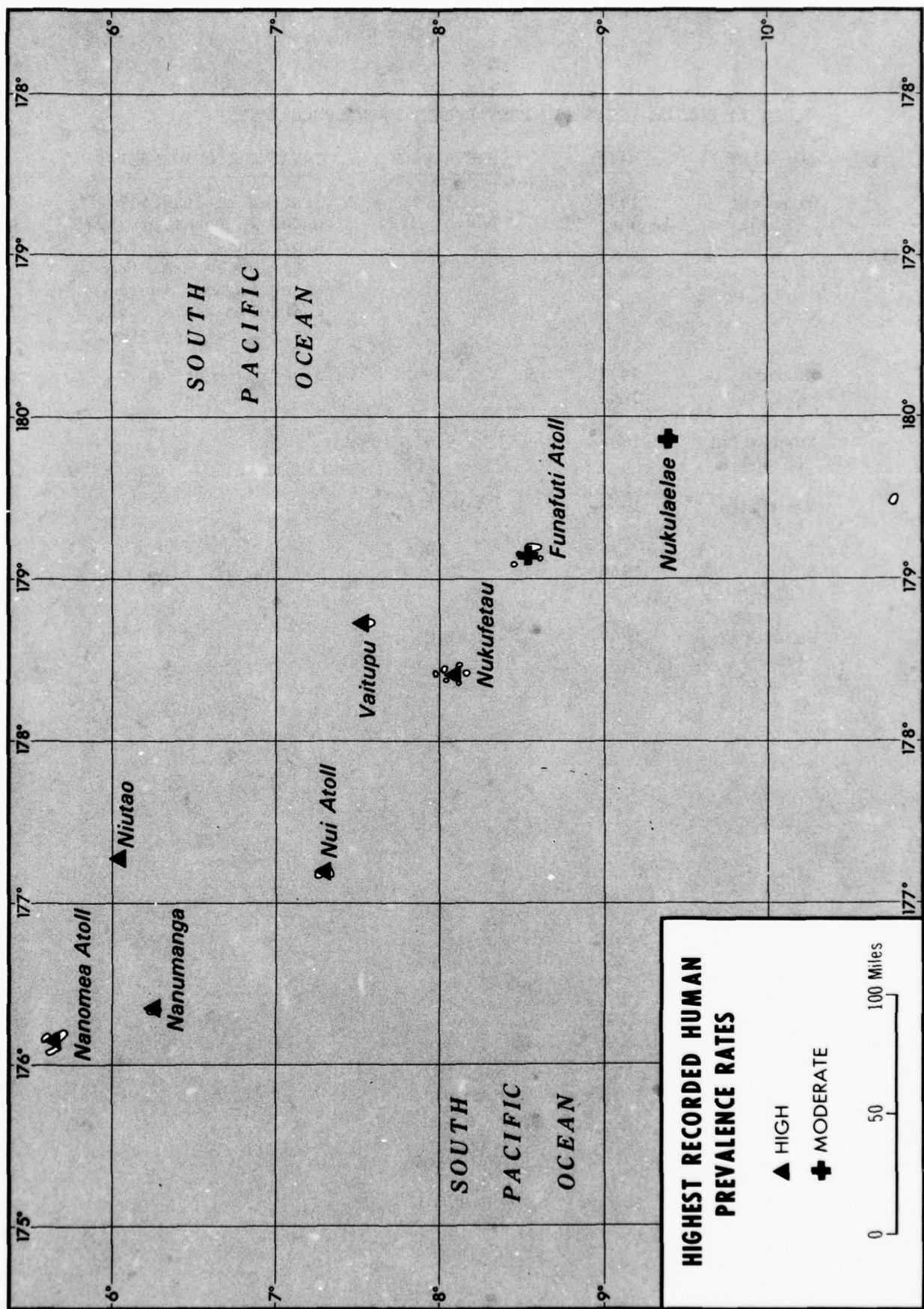
G. Ellice Islands

1. Human Data

Mosquito control measures on Vaitupu began with spraying in 1957 which was continued until 1960. In 1959, the underbrush was cleared. On Funafuti, spraying was introduced in 1961 along with treatment measures. Treatment was re-introduced in 1972. On Vaitupu, treatment was first introduced in 1959 and re-introduced in 1974. The geographic distribution of the highest prevalence rates can be found in Map 42. The majority of the rates were in the high (greater than 50.0%) range. It should be noted, however, that these prevalence rates were taken from a survey conducted in 1920 and 1921. The most recent prevalence rates can be found in Table 11. During World War II, the United States Marines occupied Funafuti, but they did not occupy Vaitupu. It has been suggested that the Marines altered the epidemiological situation by the introduction of improved sanitation measures, spraying and the use of drugs. Unfortunately, there is no information in the Disease Information System that will support or disclaim this assertion. The prevalence rates for Funafuti have generally been slightly lower than Vaitupu. However, when control and treatment measures were introduced, no survey was conducted in which the prevalence rates could be definitely related to alterations of the environment.

2. Mosquito Data

Information on the role and bionomics is presented in Table 12. The geographic distribution of the various mosquito species for which detailed information was available can be found in Maps 43 to 48.



ELLIICE ISLANDS

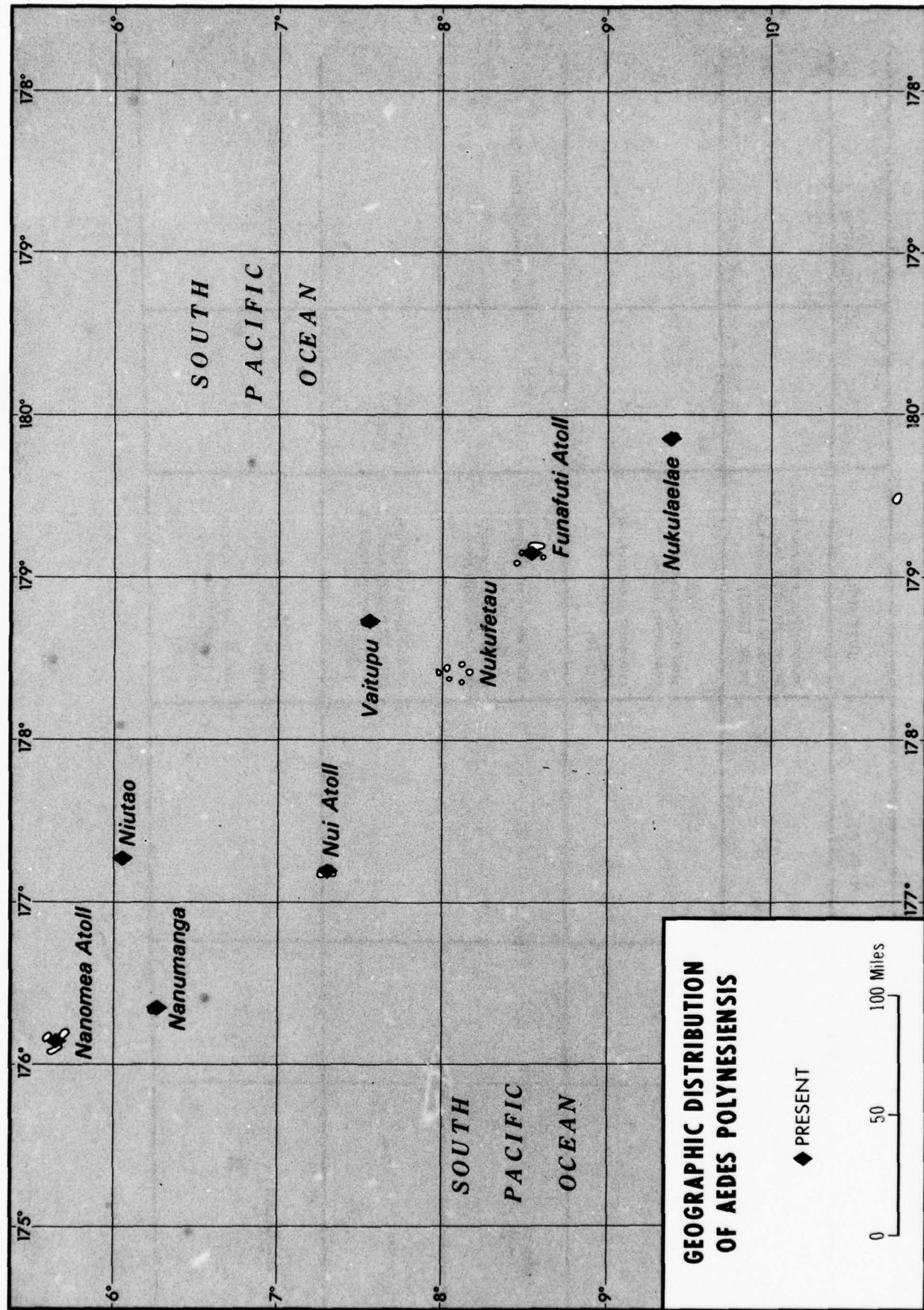
Table 11 ELLICE ISLANDS - MOST RECENT PREVALENCE RATES

<u>LOCATION</u>	<u>DATE</u>	<u>PREVALENCE</u>	<u>TREATMENT INFORMATION</u>
Funafuti (2135)	1974 January 30	3.7%	Started in July, 1972 ended in December, 1973. 4 of 5 positives in this survey came from other islands where control measures had not yet been adopted.
Vaitupu (2125)	1971 June	32.9	pre-treatment
Nukulailai (2146)	1968	9.9	
Nanumanga (2146)	1968	16.6	
Nui (2146)	1968	23.7	
Nukufetau (2146)	1967	27.0	

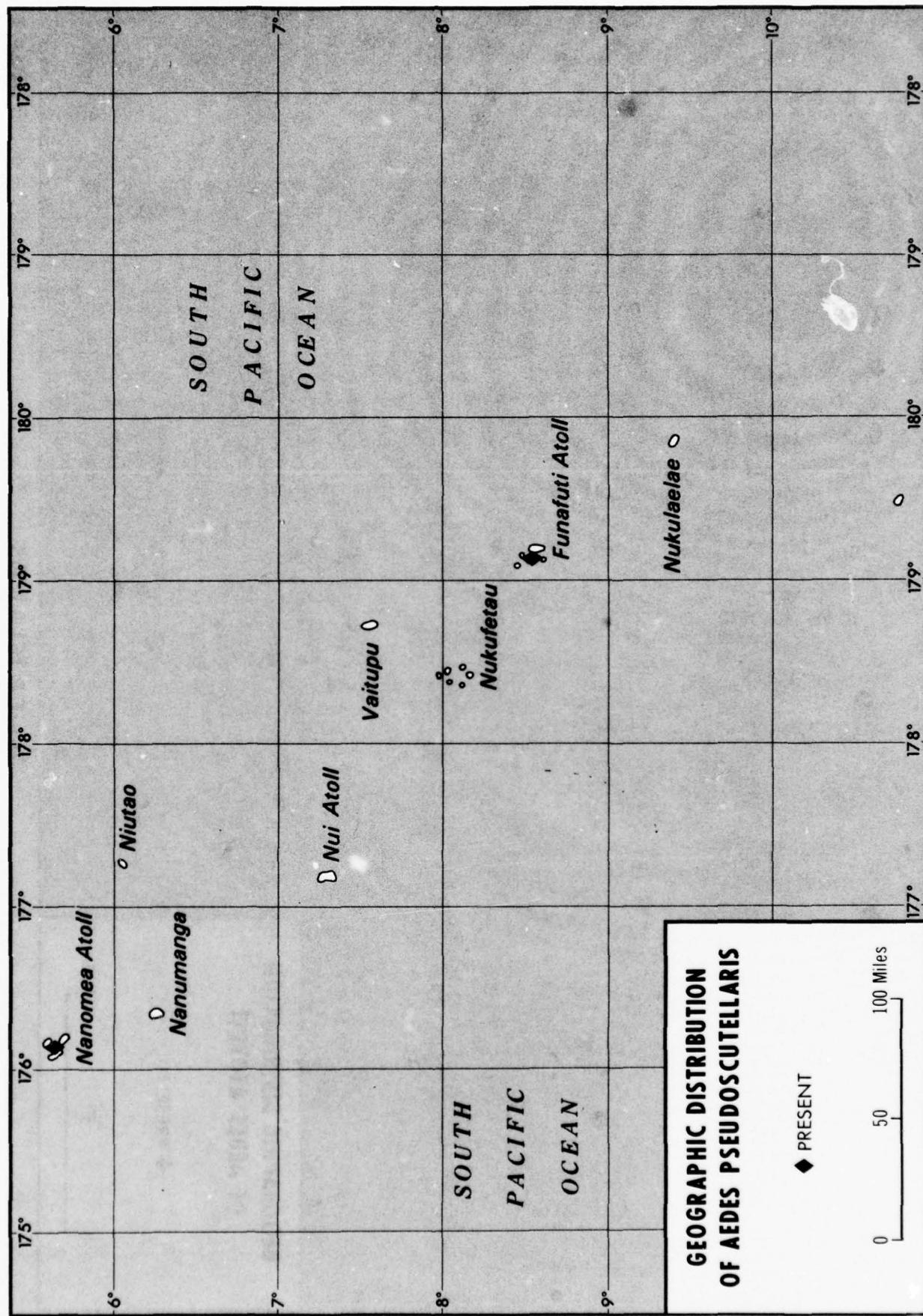
Table 12
ELLIICE ISLANDS — MOSQUITO DATA

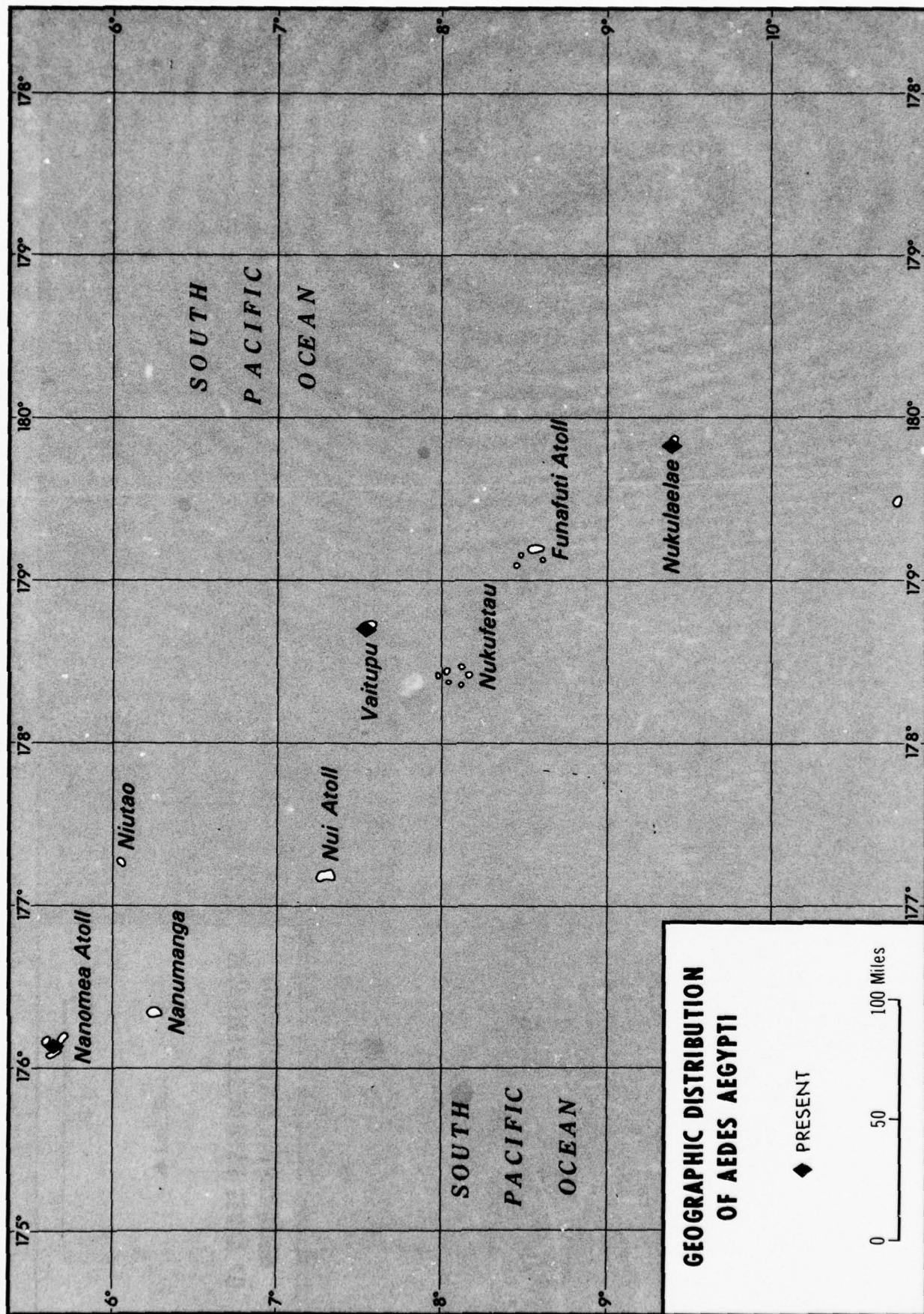
	ROLE	HABITAT	BREEDING	BITING	REMARKS
* <i>Aedes polynesiensis</i>	non-periodic vector. (2036)	coconut husks in underbrush, water catchment drums, no larvae in leaf axils or tide pools. (2080)			
* <i>Aedes pseudoscutellaris</i>		steel drums used as water containers. (2030) rain water in natural and artificial containers. (2019)			
<i>Aedes aegypti</i>		rain water in natural and artificial containers, taro pits and rain water containers. (2019)			additional source: 2080.
<i>Aedes vexans</i>		shallow pools in taro pits. pH = 7.0 to 8.2. water temperature = up to 37°C. (2080)		night biter. (2080)	
<i>Culex annulirostris</i>		brackish seepage, water wells, taro pits. (2019) fresh or stagnant water in pools, road ruts and artificial containers. (2025)			additional source: 2080.

* Major Vector



ELICE ISLANDS

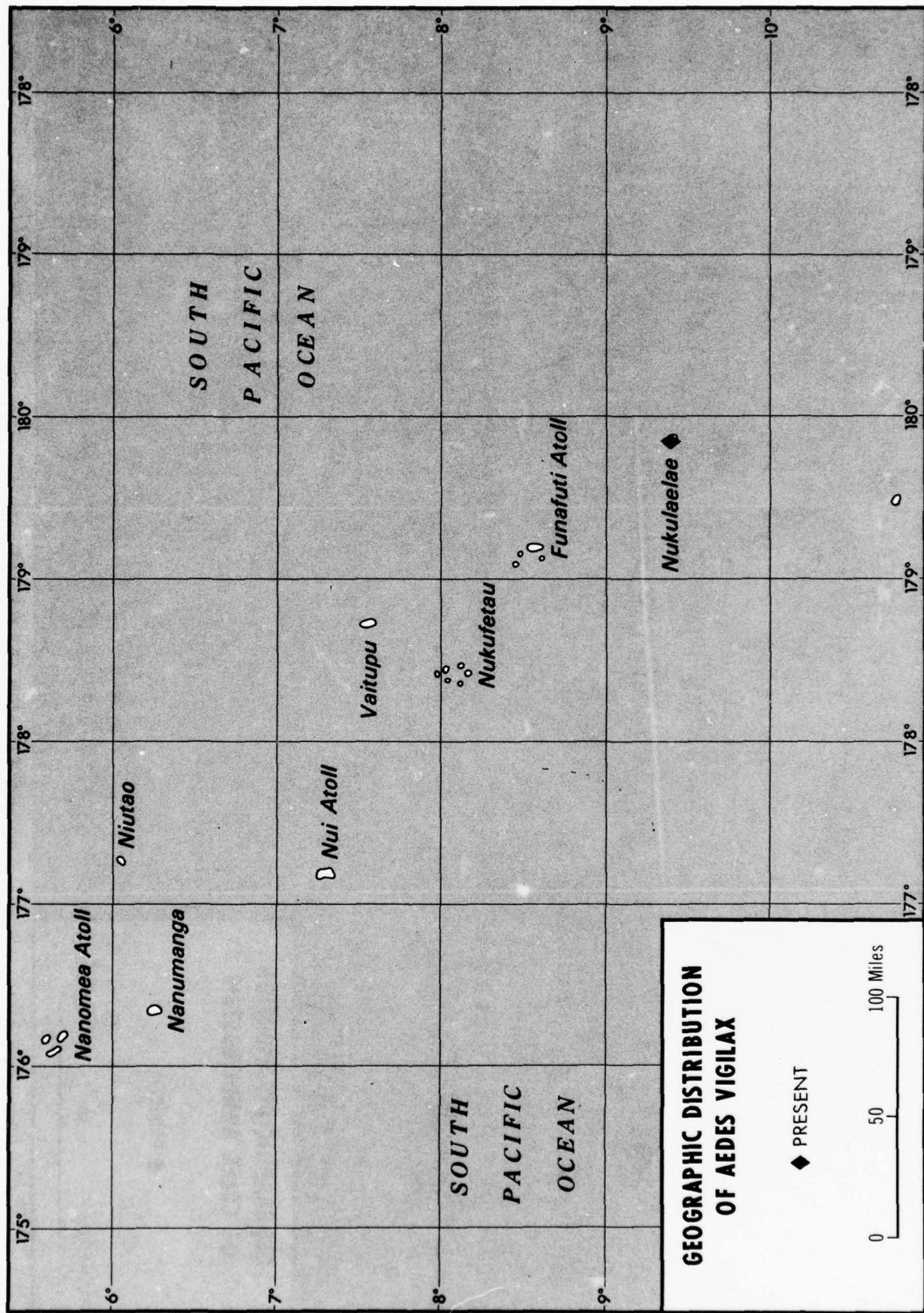




**GEOGRAPHIC DISTRIBUTION
OF *AEDES AEGYPTI***

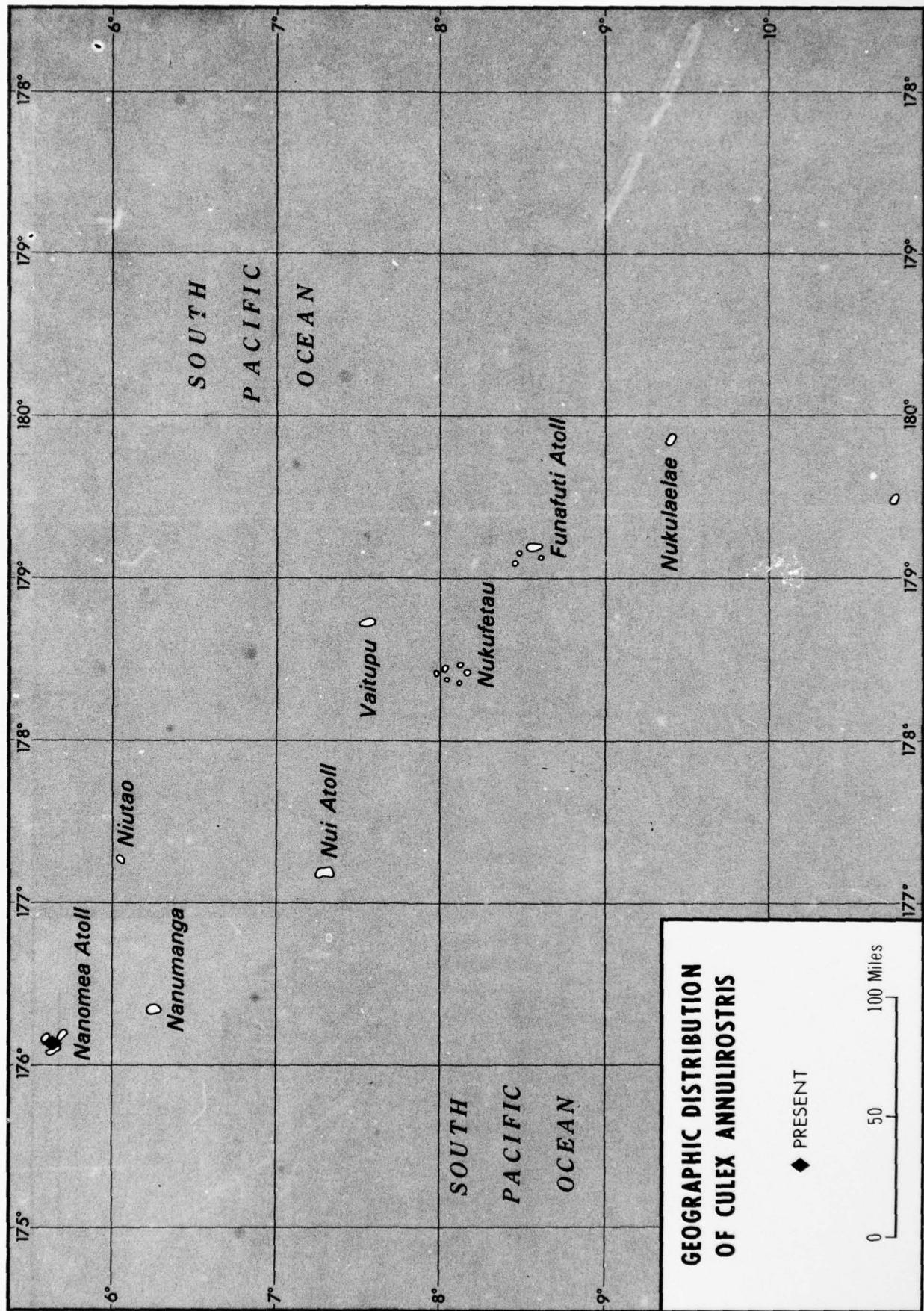
◆ PRESENT

0 50 100 Miles



ELLICE ISLANDS

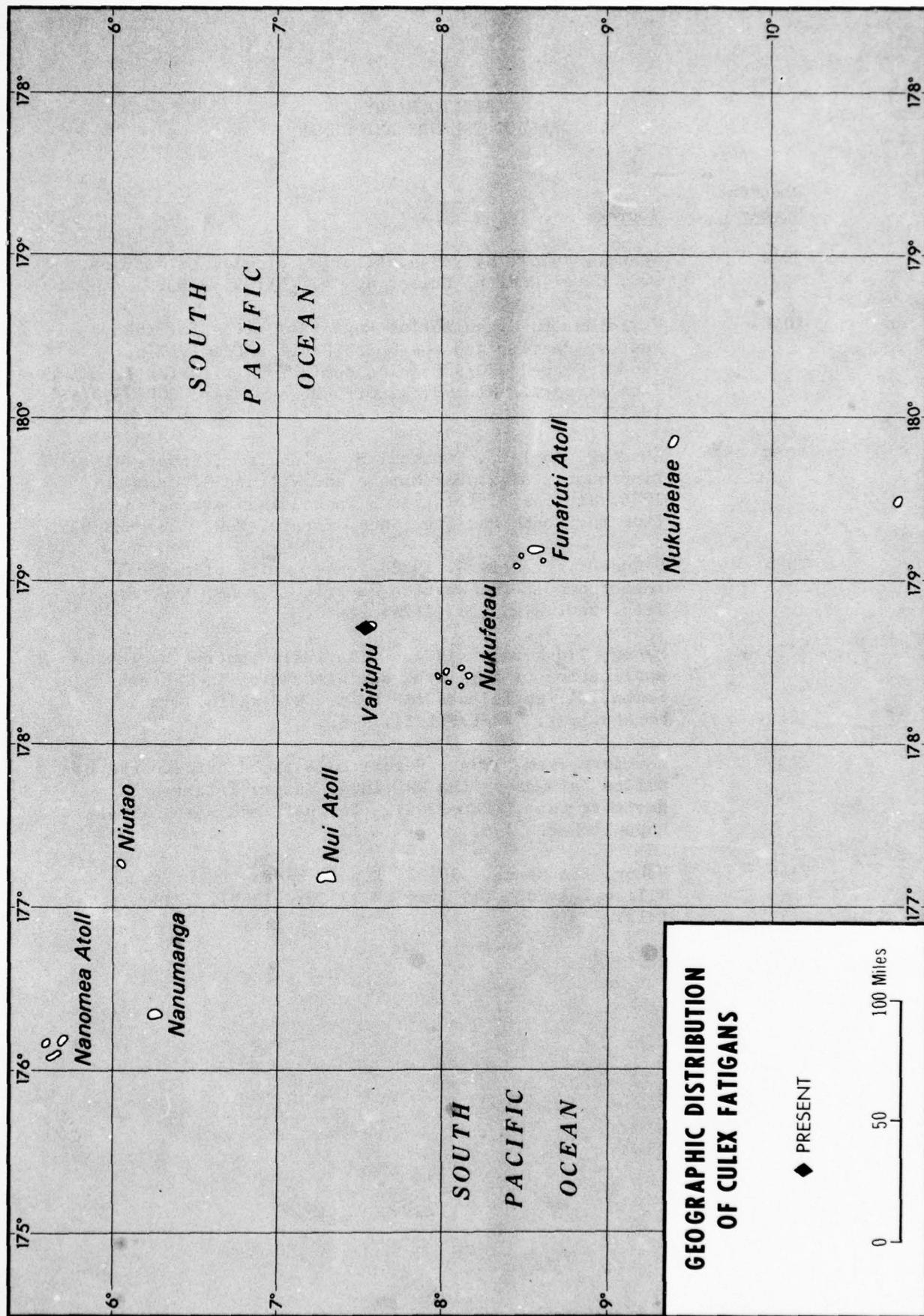
MAP 46



GEOGRAPHIC DISTRIBUTION OF *CULEX ANNULIROSTRIS*

◆ PRESENT

100 Miles



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2146	Maung, Tin Maung. 1969. Report on the visit to Ellice Island. (19 June to 27 June 1969). Unpublished. 1-13.

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ELLICE ISLAND AND MOSQUITO

<u>Document Number</u>	<u>Source</u>
2019	Venner, Robert B. 1944. Filarial problem on Nanumea. U.S. Naval Medical Bulletin. 43 (5): 955-963.
2030	Byrd, Elon E. and Lyle S. St. Amant. 1959. Studies on the epidemiology of filariasis on Central and South Pacific islands. South Pacific Commission Technical Paper #125: 1-96.
2036	Manson-Bahr, Philip and W. J. Muggleton. 1952. Further research on filariasis in Fiji. Trans. Roy. Soc. Trop. Med. Hyg. 46 (3): 301-326.
2080	Laird, Marshall. 1955. Notes on the mosquitos of the Gilbert, Ellice and Tokelau Islands, and on filariasis in the latter group. Bull. Ent. Res. 46: 291-300.
2125	Maung, Tin Maung. 1974. Filariasis control by the application of mass drug administration in Western Samoa, Ellice Islands and Niue. Wld. Hlth. Org. Monogr. Ser. #WPR/FIL/11: 1-6.
2134	Advisory Team. 1973. Quarterly report of the WHO intercountry filariasis advisory team. Third quarter, 1973. Unpublished. 1-2.
2135	Advisory Team. 1974. Report on a field trip to the Ellice Islands by the WHO intercountry filariasis advisory team (WPRO-2201). February and March 1974. Unpublished. 1-6.
2146	Maung, Tin Maung. 1969. Report on the visit to Ellice Island. (19 June to 27 June 1969.) Unpublished. 1-13.

H. Tonga Islands

1. Human Data

As evidenced by comparing the highest human prevalence rates (Map 49) with the most recent prevalence rates (Table 13), no attempt at mosquito control or treatment efforts has been introduced. The prevalence data given here were obtained by membrane filter concentration of one ml. venous blood. This technique has consistently given 2 to 6 times higher (depending on the age group examined) rates than by conventional examination of 20 to 60 cmm. stained thick blood films. Prevalence figures for various age groups obtained in age-stratified surveys are shown in Tables 13, 13A, and 13B. These tables illustrate the need for age-stratified surveys and the necessity of applying the MFC technique to the younger age groups.

2. Mosquito Data

Information on the role and bionomics is presented in Table 14. The geographic distribution of the various mosquito species for which detailed information was available can be found in Maps 50 to 55.

There appears to be a remarkable diversity of the A. Scutellaris group within the Tongan Island chain (and probably elsewhere in Polynesia). The taxonomic status of these members -- whether they are strains or sibling species -- has not yet been fully determined.

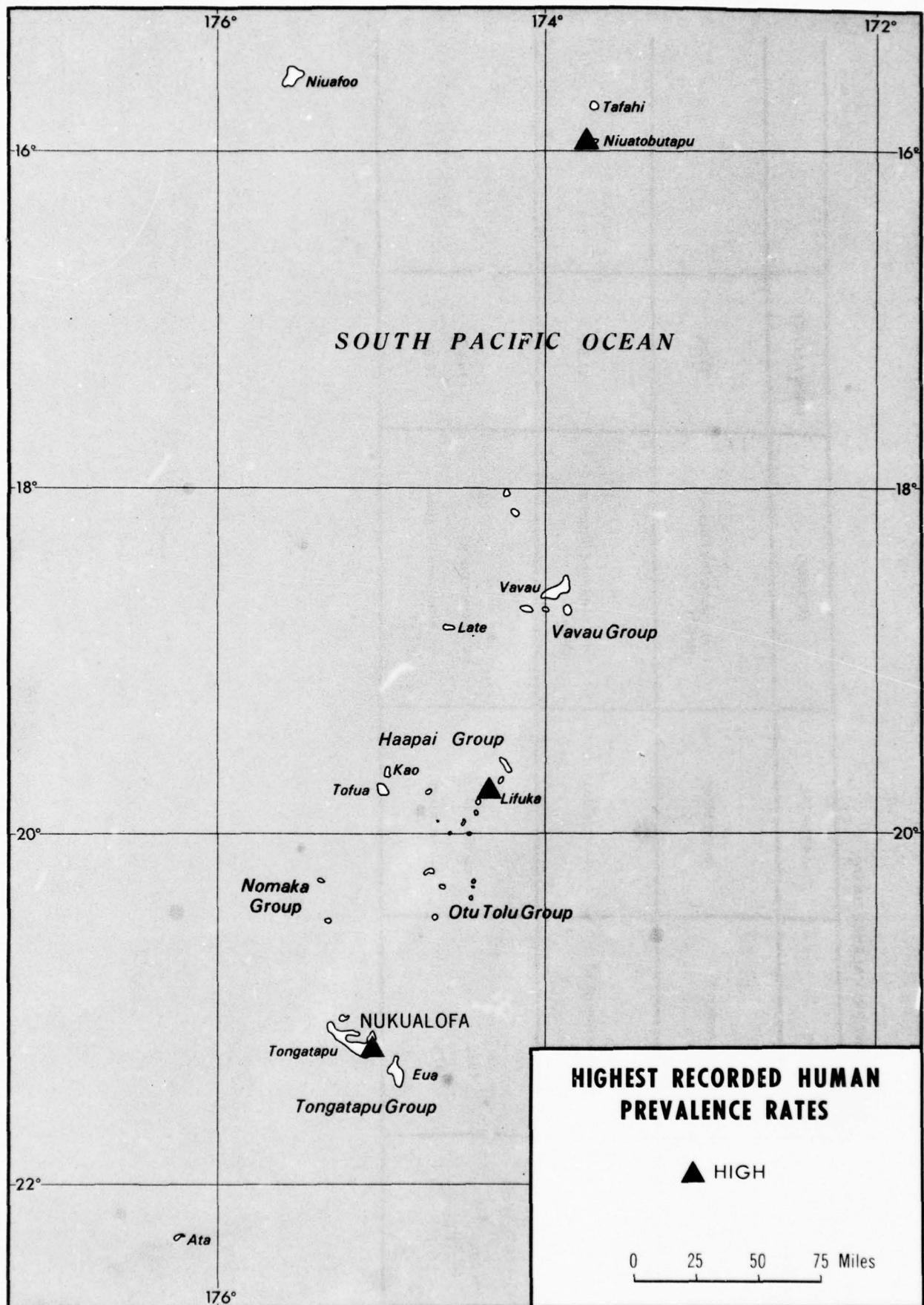


Table 13
TONGA ISLANDS — MOST RECENT PREVALENCE DATA

LOCATION	DATE	MATERIAL	METHOD	PREVALENCE
TONGATABU Teletiu (2088)	July 27 to August 5 1973	venous blood	1 ml. membrane filtration (MFC)	37.4%
HAAPAI Pangai (2088)	August 6 to August 13 1973	venous blood	1 ml. membrane filtration (MFC)	51.5%
NIUATOPUTAPU Hihifo (2036)	1970	capillary blood venous blood	3 x 20 cmm smear 1 ml. membrane filtration (MFC)	16.0% 70.0%

Table 13A. Microfilaria rates and densities of Te'ekiu villagers,
Tongatapu, Tonga.

Age group (years)	No. in group	mf + ve % (no.)	No. mf + ve gt 25 mf/ml	No. mf + ve gt 25 mf/ml	lt 25 mf/gt 25 mf/ml (= MFC/60 mm blood film factor)
0-4	43	23.2% (10)	9	1	9.0
5-9	74	24.3% (18)	16	2	8.0
10-15	46	26.1% (12)	7	5	1.4
16-19	20	25.0% (4)	1	3	0.33
20-49	85	52.9% (45)	19	26	0.73
gt 50	29	75.9% (22)	7	15	0.47
TOTAL	297	37.4% (111)	59	52	1.1

Table 13B. Microfilaria rates and densities of villages of Pangai Island, Ha'apai Group, Tonga.

Age group (years)	No. in group	mf + ve % (no.)	No. mf + ve gt25 mf/ml	No. mf + ve gt25 mf/ml	st25 mf/gt25mf/ml (= MFC/60 mm blood film factor)
0-4	39	56.4% (22)	19	3	6.3
5-9	43	28.9% (13)	11	2	5.5
10-15	57	35.1% (20)	16	4	4.0
16-19	33	54.5% (18)	9	9	1.0
20-49	103	59.2% (61)	26	35	0.74
gt50	34	73.5% (25)	15	10	1.5
TOTAL	309	51.5% (159)	96	63	1.5

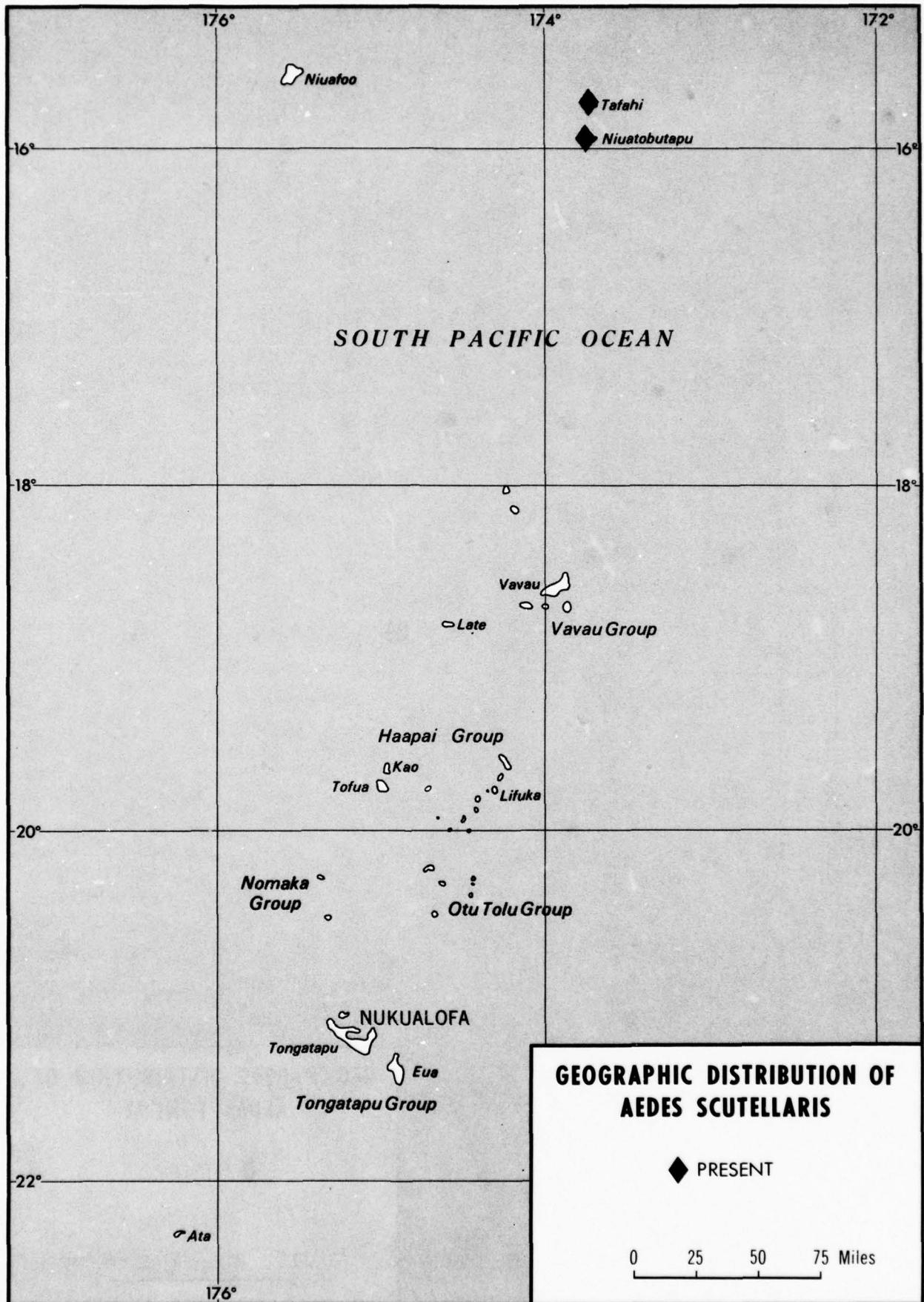
Table 14
TONGA ISLANDS — MOSQUITO DATA

	ROLE	HABITAT	BREEDING	BITING	REMARKS
* <i>Aedes scutellaris</i>	efficient vector. (2136) experimental infection very successful. (2052)			day biter. (2042) day biter with peak at 1000 to 1200. (2020)	capable of autogeny .. development of eggs without first taking blood meal. (2052) additional source: 2014.
* <i>Aedes tabu</i>	major vector only in Tonga. (2042) not in houses. (2020)	bush mosquito found resting in tree holes and other sheltered tree locations.	rain water containers, coconut shells, discarded tins, tree holes. (2042) tree holes, artificial containers, coconut shells and spathes, leaf axils of taro. (2020)		only reported in Tongatapu and Haapai group. (2020) number of eggs/female in a sample of 7 = 47.6. (2020) additional source: 2136.
* <i>Aedes tongae</i>	vector. (2015) suspected vector. (2042)				only reported in Haapai and Vavau groups. (2020)
<i>Aedes aegypti</i>					source: 2020.
<i>Aedes finlaya</i>					source: 2052.
<i>Aedes nocturnus</i>					vicious night biter. (2052) additional source: 2020;
* Major Vector					

Table 14 cont.

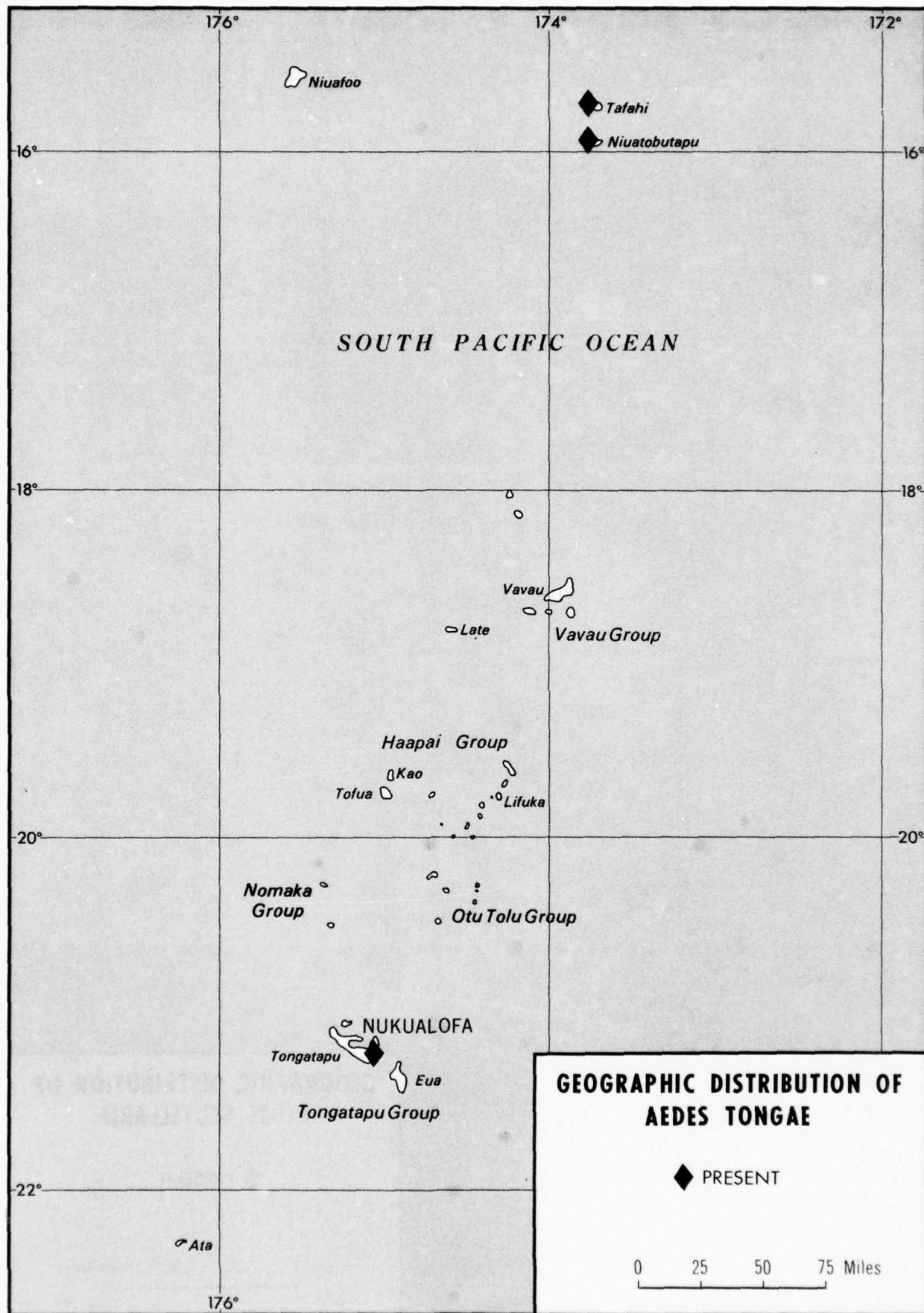
TONGA ISLANDS — MOSQUITO DATA

	ROLE	HABITAT	BREEDING	BITING	REMARKS
<i>Aedes</i> <i>oceanicus</i>					sources: 2020, 2022.
<i>Culex</i> <i>annulirostris</i>					source: 2020.
<i>Culex</i> <i>fatigans</i>					source: 2020



TONGA ISLANDS

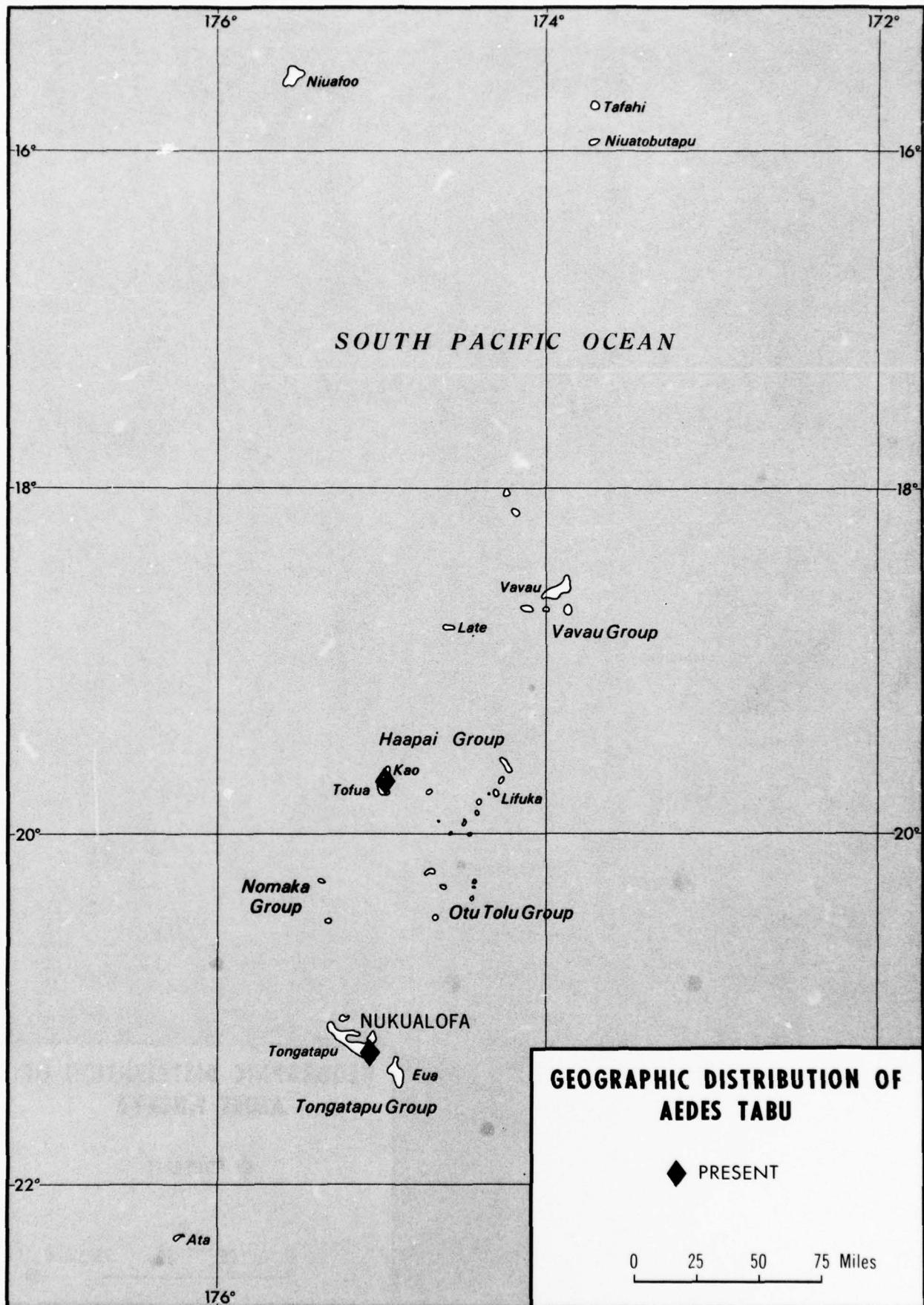
MAP 50

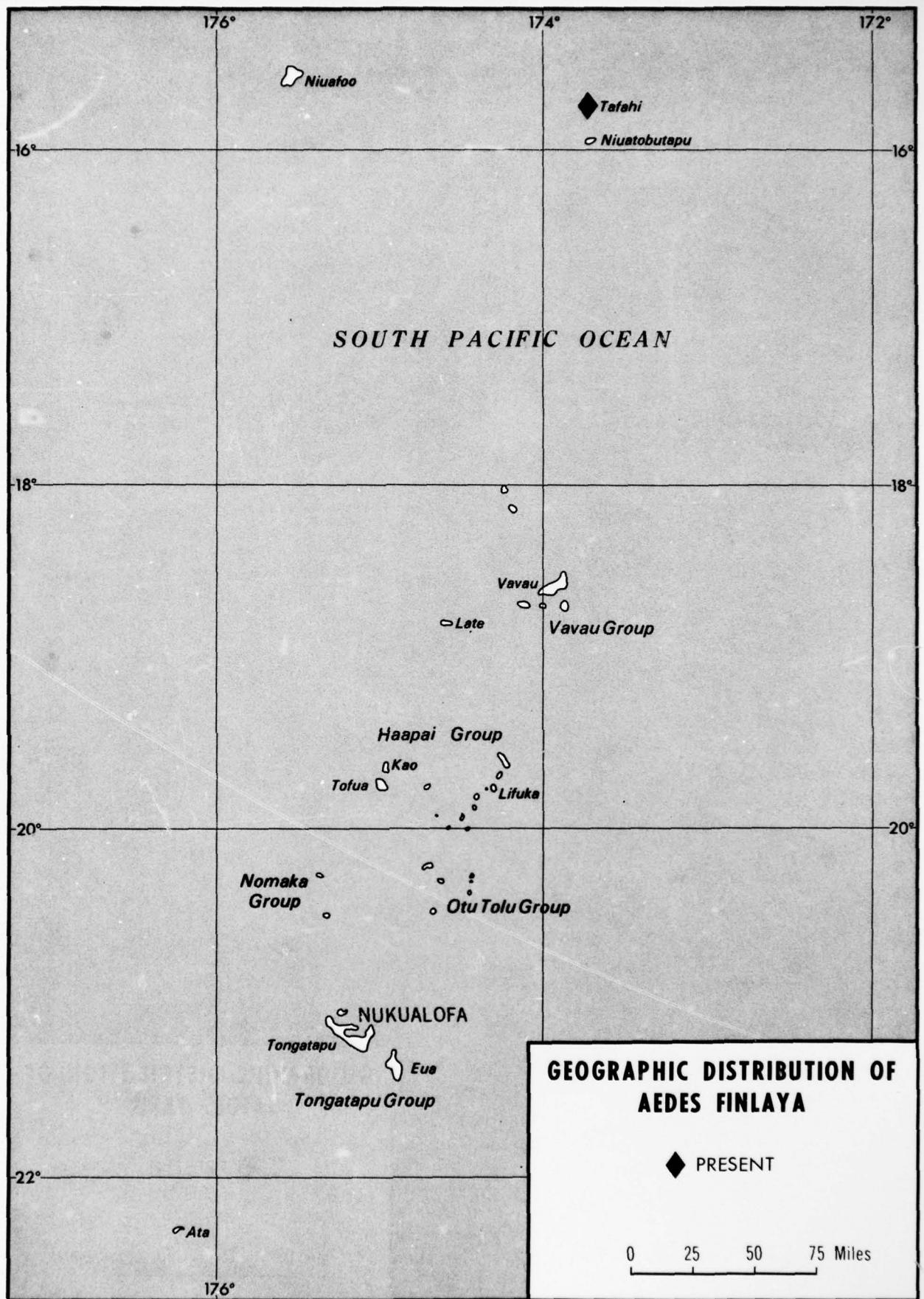


GEOGRAPHIC DISTRIBUTION OF
AEDES TONGAE

◆ PRESENT

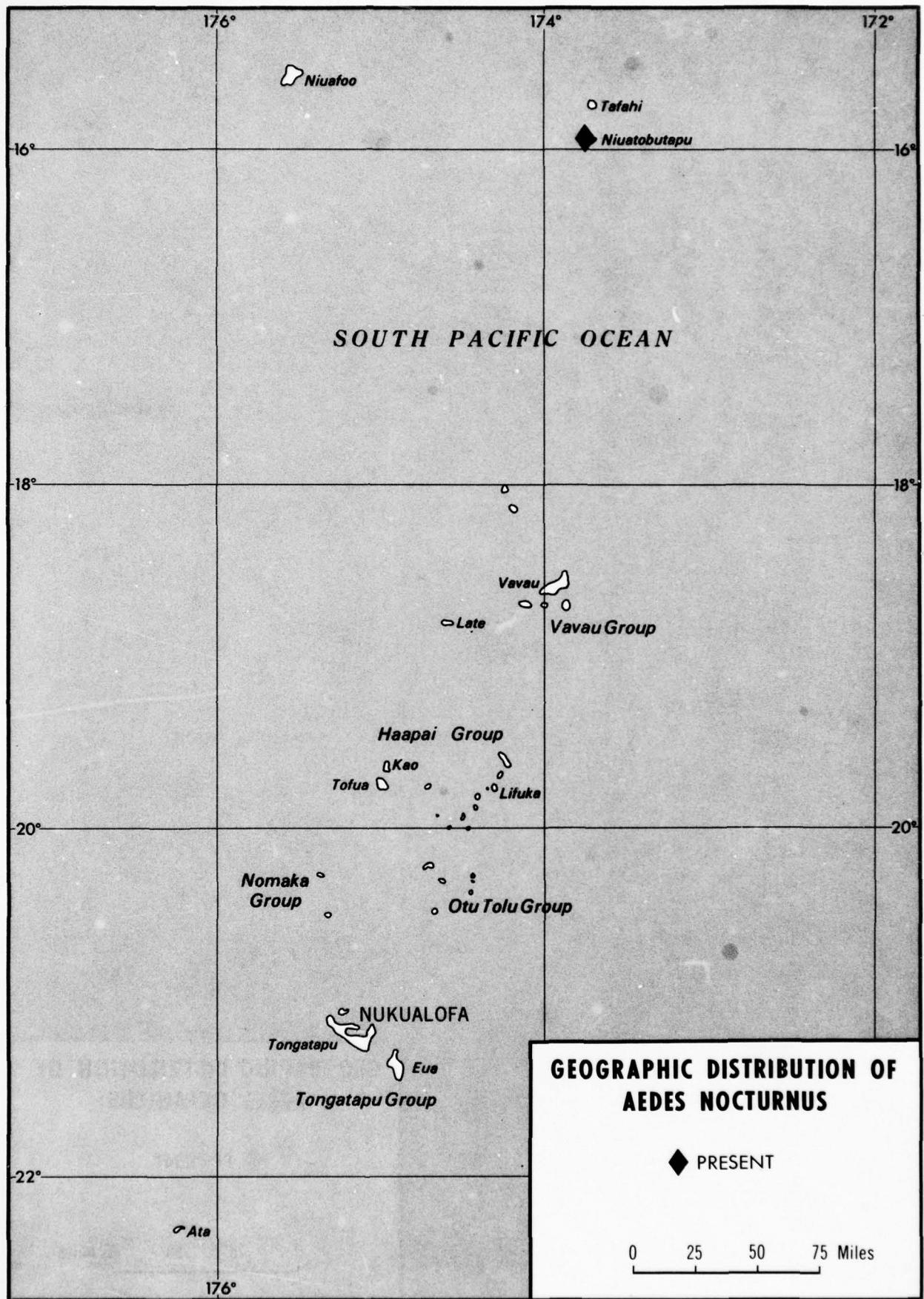
0 25 50 75 Miles





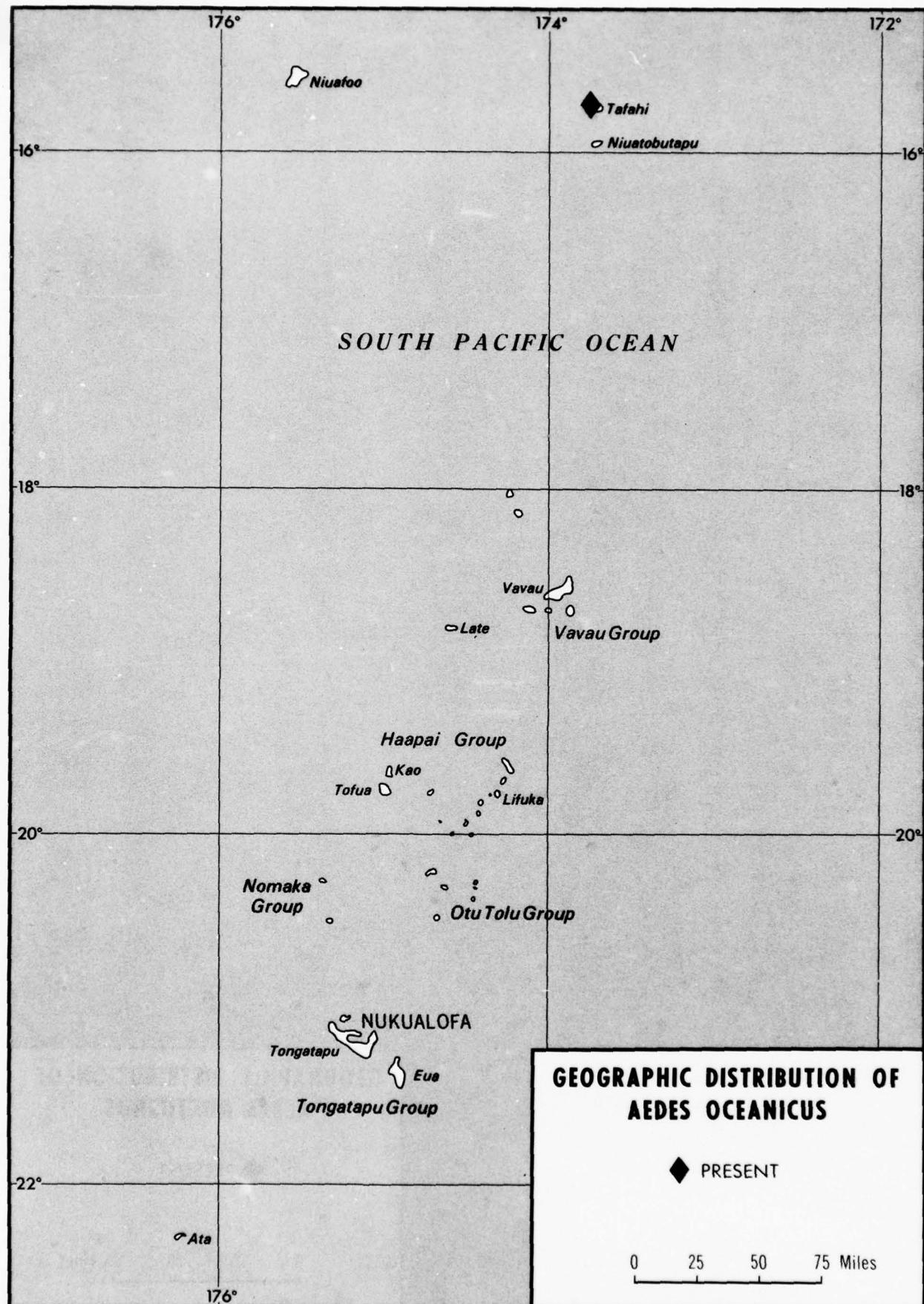
TONGA ISLANDS

MAP 53



TONGA ISLANDS

MAP 54



TONGA ISLANDS

MAP 55

BIBLIOGRAPHY

TONGA ISLANDS AND HUMAN

<u>Document Number</u>	<u>Source</u>
2007	Hitchcock, James C. Jr. 1969. UCLA mosquito studies in Tonga - 1968. Proceedings of the 56th annual meeting of the New Jersey Mosquito Extermination Association. 116-122.
2075	Swartzwelder, John Clyde. 1941-45. Filariasis bancrofti. Preventive medicine in World War II. Volume VII Communicable diseases. Washington, D.C.: Department of the Army. 563-71.
2084	Goodman, Abel A., Emmanuel M. Weinberger, Stuart W. Lippincott, Alexander Marble and Willard H. Wright. 1945. Studies of filariasis in soldiers evacuated from the South Pacific. Ann. Intern. Med. 23: 823-835.
2088	Desowitz, Robert S. and Steven J. Berman. 1973. Epidemiological investigations on filariasis in the South Pacific and Indonesia. Report on visits made from 18 July to 9 September 1973. Unpublished. WHO consultants. 1-48.
2136	Hitchcock, J.C. 1974. Filariasis surveys in the Kingdom of Tonga. Unpublished. 1-6.

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TONGA ISLANDS AND MOSQUITO

<u>Document Number</u>	<u>Source</u>
2007	Hitchcock, James C. Jr. 1969. UCLA mosquito studies in Tonga - 1968. Proceedings of the 56th Annual Meeting of the New Jersey Mosquito Extermination Association. 116-122.
2014	Hitchcock, James C. Jr. 1970. Evaluation of filariasis mosquito surveys based on the physiological age of the vector. Jour. Parasit. 56 (4): 149.
2015	Ramalingam, Shivaji and John N. Belkin. 1964. Vectors of sub-periodic bancroftian filariasis in the Samoa Tonga area. Nature. London. 201: 105-106.
2020	Ramalingam, Shivaji. 1968. Epidemiology of filarial transmission in Samoa and Tonga. Ann. Trop. Med. Parasit. 62: 305-323.
2022	Hitchcock, J. C. Jr. 1971. Transmission of sub-periodic filariasis in Tonga by <u>Aedes oceanicus</u> Belkins. Trans. Roy. Soc. Trop. Med. Hyg. 65: 408-409.
2042	World Health Organization Regional Office for the Western Pacific and the South Pacific Commission. 1968. Second WHO/SPC joint seminar on filariasis. Final report. Wld. Hlth. Org. Monogr. Ser. #WPR/350/68: 1-44.
2052	Hitchcock, J. C. 1970. Progress report - His Majesty King Taufa'Ahau Tupou IV Kingdom of Tonga. Unpublished. 1-3.
2136	Hitchcock, J. C. 1974. Filariasis surveys in the Kingdom of Tonga. Unpublished. 1-6.

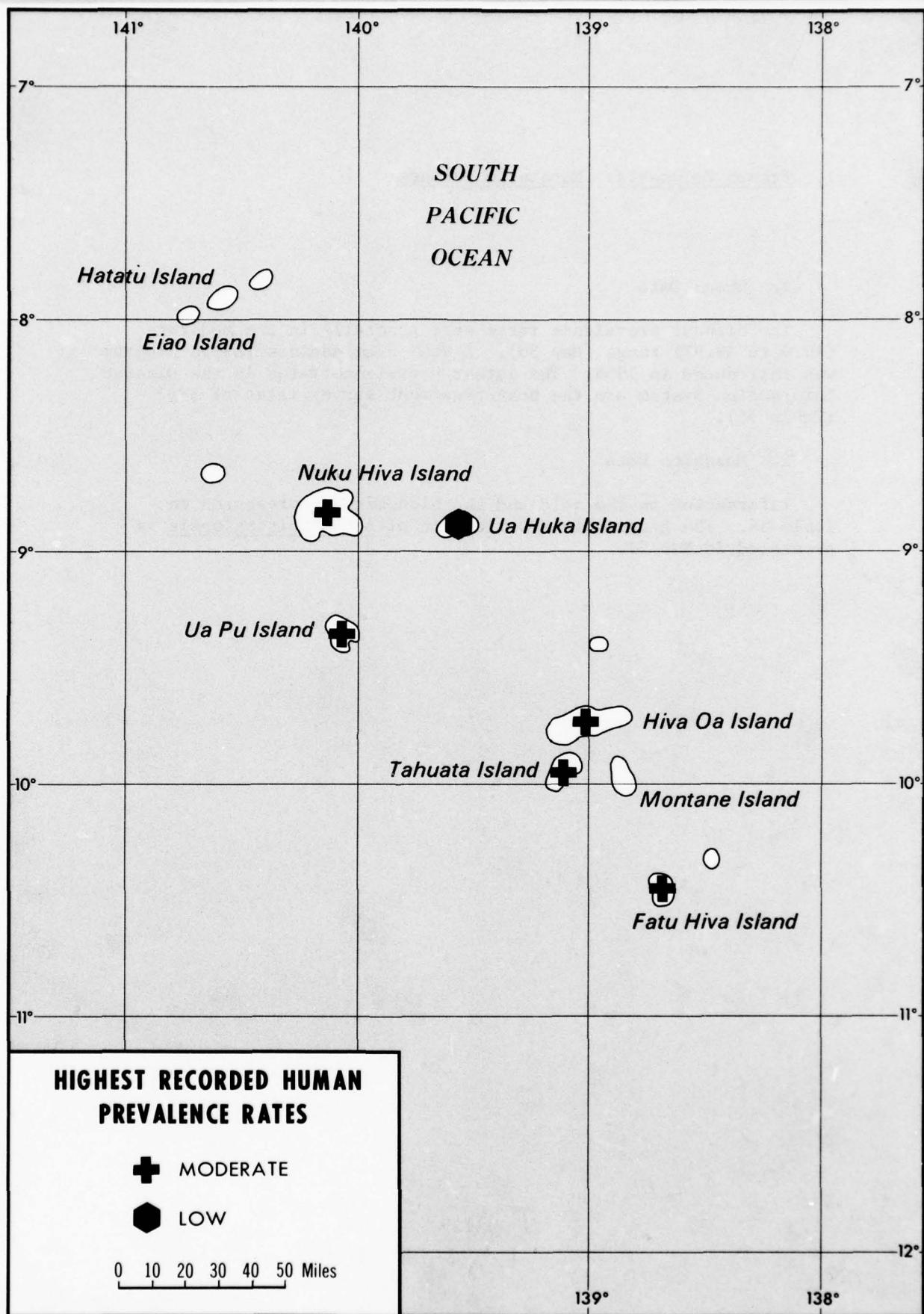
I. French Polynesia: Marquesas Islands

1. Human Data

The highest prevalence rates were generally in the moderate (10.0 to 49.9%) range (Map 56). A mass drug administration program was introduced in 1956. The latest prevalence rates in the Disease Information System are the post-treatment survey rates of 1957 (Table 15).

2. Mosquito Data

Information on the role and the bionomics is presented in Table 16. The geographic distribution of Aedes polynesiensis is presented in Map 57.



MARQUESAS ISLANDS

Table 15 MARQUESAS ISLANDS - Most Recent Human Prevalence Rates

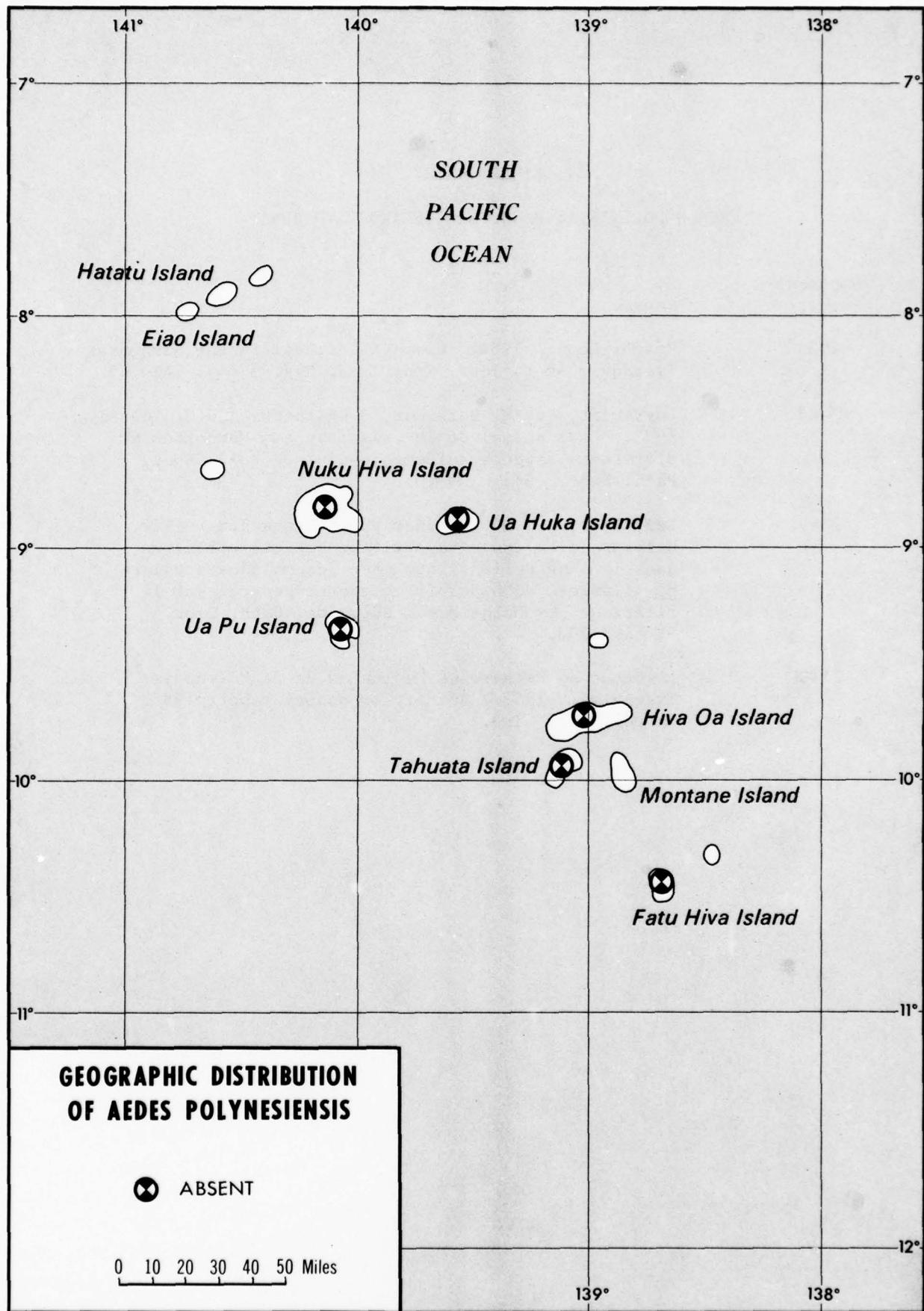
Post Treatment Survey - 1957

<u>LOCATION</u>	<u>PREVALENCE RATES</u>
MARQUESAS ISLANDS	
Ua Huka	18.1%
Fatu Hiva	13.5
Tahuata	11.1
Hiva Oa	6.4
Nuku Hiva	2.3
Ua Pou	1.1

Table 16
FRENCH POLYNESIA: MARQUESAS ISLANDS - MOSQUITO DATA

	ROLE	HABITAT	BREEDING	BITING	REMARKS
* <i>Aedes polynesiensis</i>					present in all 6 inhabited islands including Nuku Hiva, Ua Huka, Ua Pou, Hiva Oa, Tahuata, and Fatu Hiva. (2034)
* <i>Aedes pseudoscutellaris</i>					present from sea level to 885 meters. (2112)
<i>Culex fatigans</i>					source: 2112.

* Major Vector



MARQUESAS ISLANDS

BIBLIOGRAPHY

FRENCH POLYNESIA: MARQUESAS ISLANDS AND HUMAN

<u>Document Number</u>	<u>Source</u>
2034	Rosen, Leon. 1954. Human filariasis in the Marquesas Islands. Amer. Jour. Trop. Med. Hyg. 3 (4): 742-745
2043	Lagraulet, J., M. Barsinas, G. Fagneau and M. Teahui. 1973. Etat actuel de la filariose aux Marquises et différents aspects épidémiologiques. Bull. Soc. Path. Exot. 66: 139-155.
2069	Lagraulet, J., M. Barsinas and G. Fagneau. 1972. Heterogénéité de la répartition des microfilaries dans le sang périphérique chez les malades atteints de filariose de bancroft et aperçu général sur la filariose aux Marquises. Bul. Soc. Path. Exot. 5: 698-703.
2140	Institut de Recherches Médicales de la Polynésie Française. 1957. Summary of annual report 1957. Unpublished. 1-5.

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FRENCH POLYNESIA: MARQUESAS ISLANDS AND MOSQUITO

<u>Document Number</u>	<u>Source</u>
2034	Rosen, Leon. 1954. Human filariasis in the Marquesas Islands. Amer. Jour. Trop. Med. Hyg. 3 (4): 742-745.
2112	Edwards, F. W. 1933. Mycetophilidae, culicidae and chironomidae and additional records of simuliidae, from the Marquesas Islands. Bernice P. Bishop Museum - Bulletin. #114: 85-92.

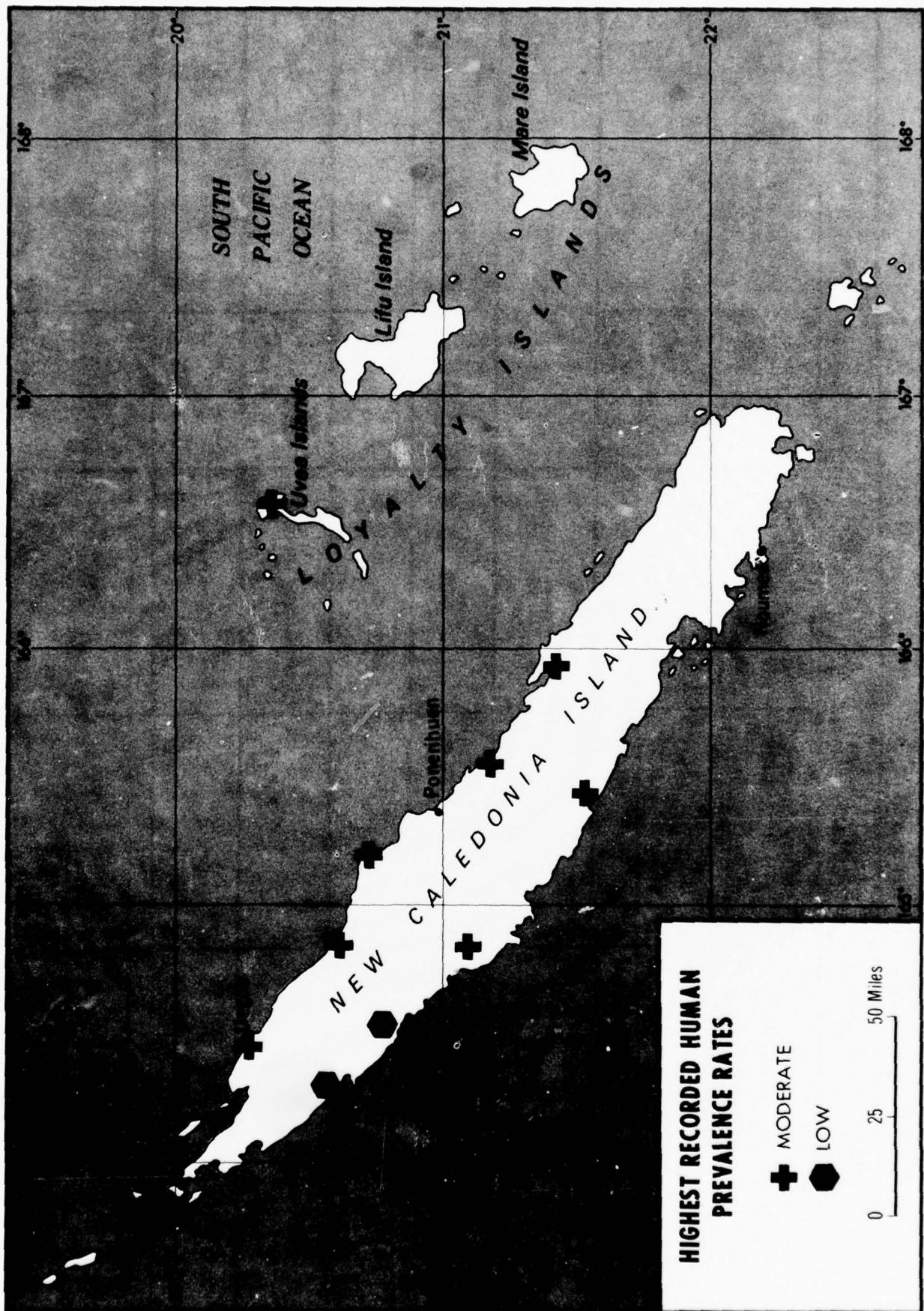
J. New Caledonia and Loyalty Islands

1. Human Data

In the articles extracted in the Disease Information System, there is no mention of the adoption of either mosquito control or treatment measures. The latest survey, in fact the only survey supplying detailed information, was taken in 1955 and 1956. In 1975, Lagraulet et. al. noted that bancroftian filariasis has been present in New Caledonia for many years, first having been reported in 1858. The focus in New Caledonia is reported now to be practically extinguished ("pratiquement éteint"), but it is noted that the vector Ae. vigilax is present in undiminished numbers and recent migrants from other endemic areas could reactivate transmission. The prevalence rates were generally in the moderate (10.0 to 49.9%) range (Map 58).

2. Mosquito Data

Information on the rôle and the bionomics is presented in Table 17. Information on the geographic distribution of the various mosquito species can be found in Maps 59 to 67. Aedes vigilax appears to be the main vector.



NEW CALEDONIA AND LOYALTY ISLANDS

Table 17

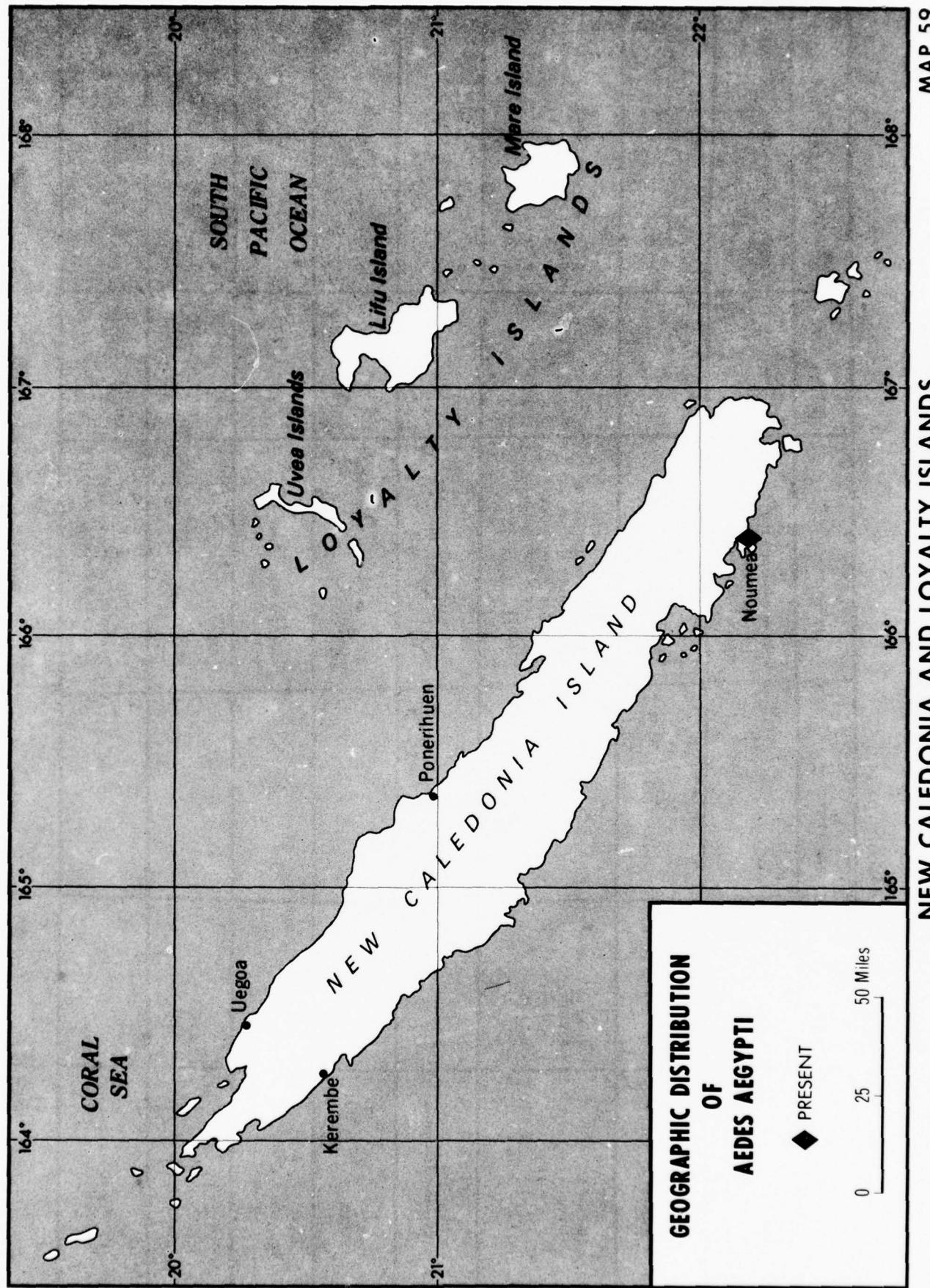
NEW CALEDONIA AND LOYALTY ISLANDS — MOSQUITO DATA

	ROLE	HABITAT	BREEDING	BITING	REMARKS
* <i>Aedes vigilax</i>	major vector. (2042) major importance is as a pest mosquito. (2025) normal development at all stages. (2081)	rests outdoors during day in grass and low vegetables. (2042)	brackish water, rock holes fresh water pools. (2042) brackish and tide water pools. (2025)	daytime. (2042)	density highest during summer months. strong flyer. (2042)
<i>Aedes aegypti</i>			fresh or foul water in any artificial container. (2025)		additional source: 2081.
<i>Aedes alternans</i>			brackish pools. (2025)		additional source: 2045.
<i>Aedes kermoganti</i>			brackish pools. (2025)		
<i>Aedes notoscriptus</i>			rock holes, tree holes, tin cans. (2025)		
<i>Aedes vexans</i>			fresh water pools and ruts. (2025)		additional source: 2045.
* Major Vector					138

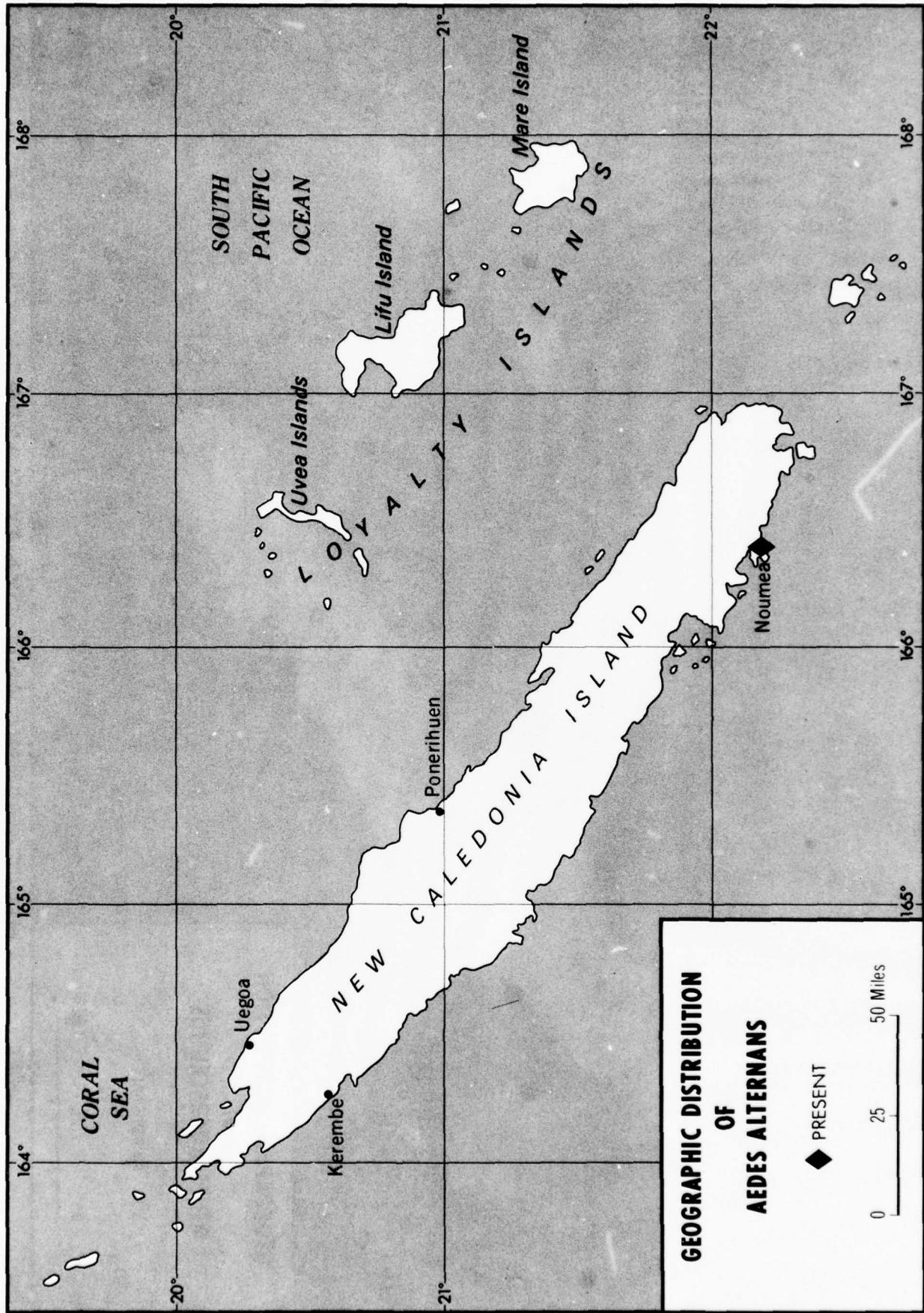
Table 17 cont.

NEW CALEDONIA AND LOYALTY ISLANDS — MOSQUITO DATA

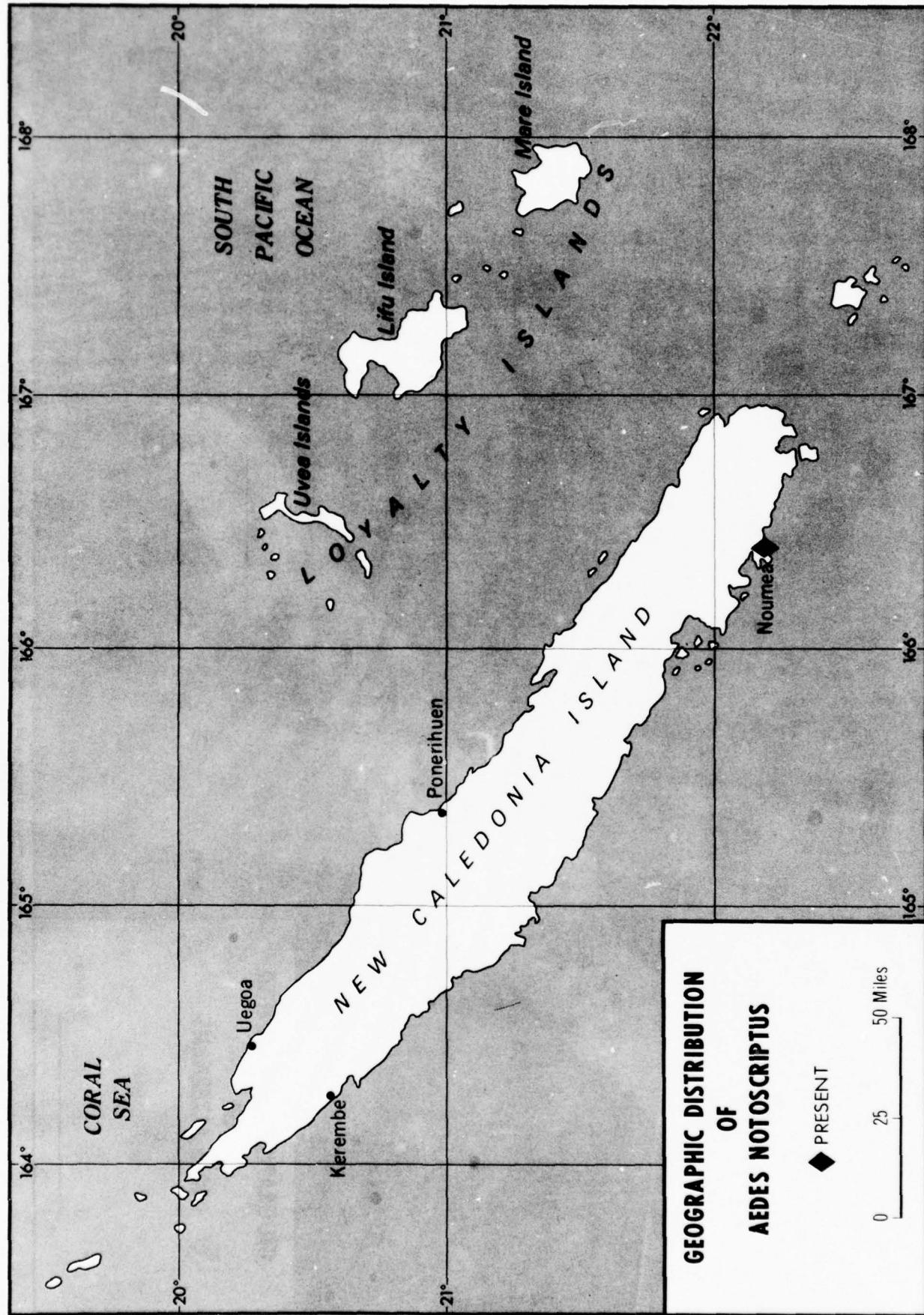
	ROLE	HABITAT	BREEDING	BITING	REMARKS
<i>Culex annulirostris</i>		fresh or stagnant water in pools, road ruts and artificial containers. (2025)			additional source: 2045.
<i>Culex basicintus</i>		algal mats in fresh water streams and rivers. (2025)			
<i>Culex fatigans</i>	suspected vector. (2025)	fresh or foul or brackish water in artificial containers and in polluted pools, ponds and swamps. (2025)			additional sources: 2045, 2081.
<i>Culex pseudomelanonotus</i>		fresh water, shallow rocky streams. (2025)			
<i>Culex sitiens</i>		mangrove swamps, tide pools. (2025)			additional source: 2045
<i>Mansonia crassipes</i>		aquatic plants in fresh water swamps. (2025)			
<i>Taeniorhynchus xanthogaster</i>					source: 2045.
<i>Tripteroides caledonica</i>		tree holes, tin cans, coconut husks, pitcher plants. (2025)			

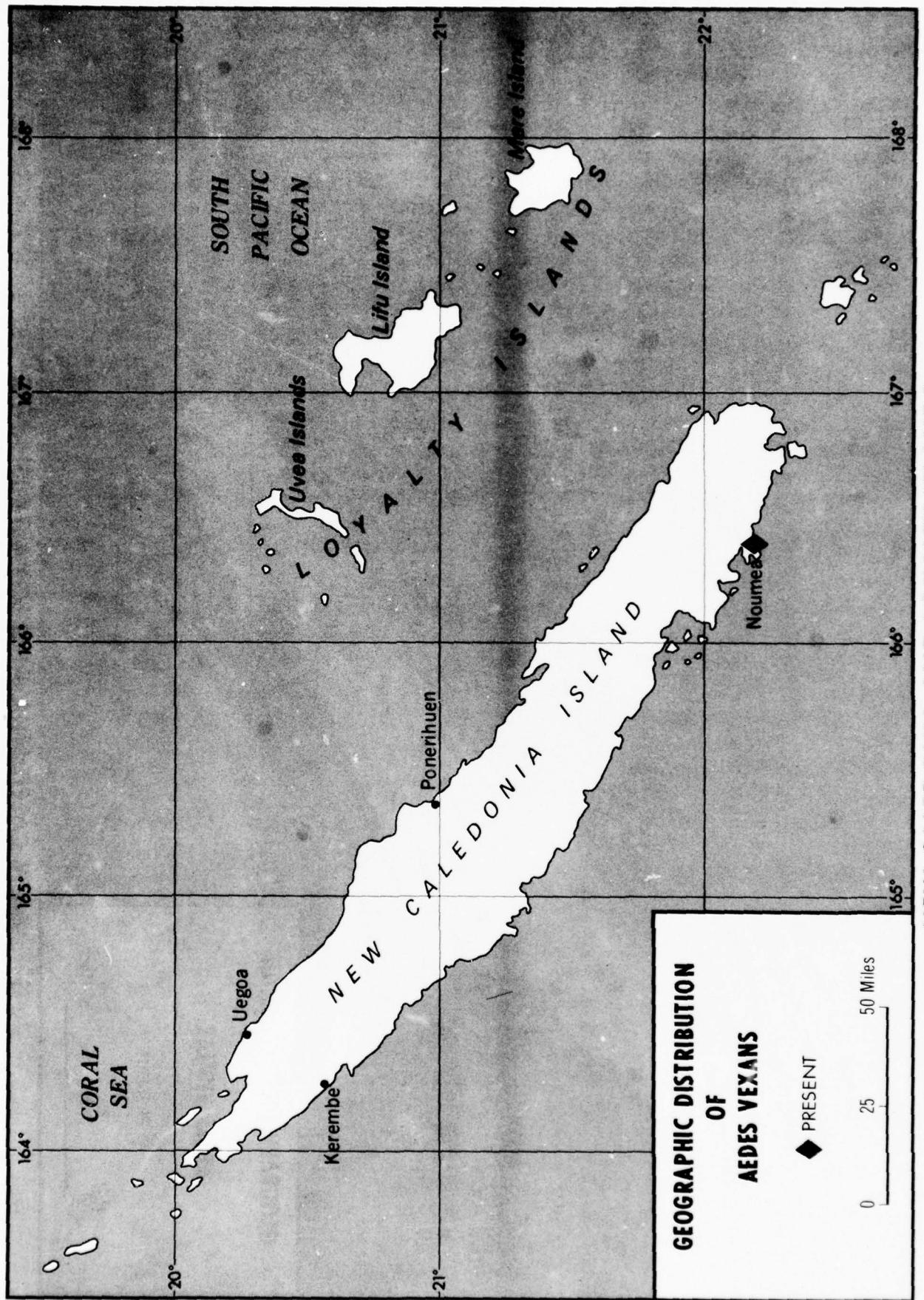


**GEOGRAPHIC DISTRIBUTION
OF
*AEDES AEGYPTI***



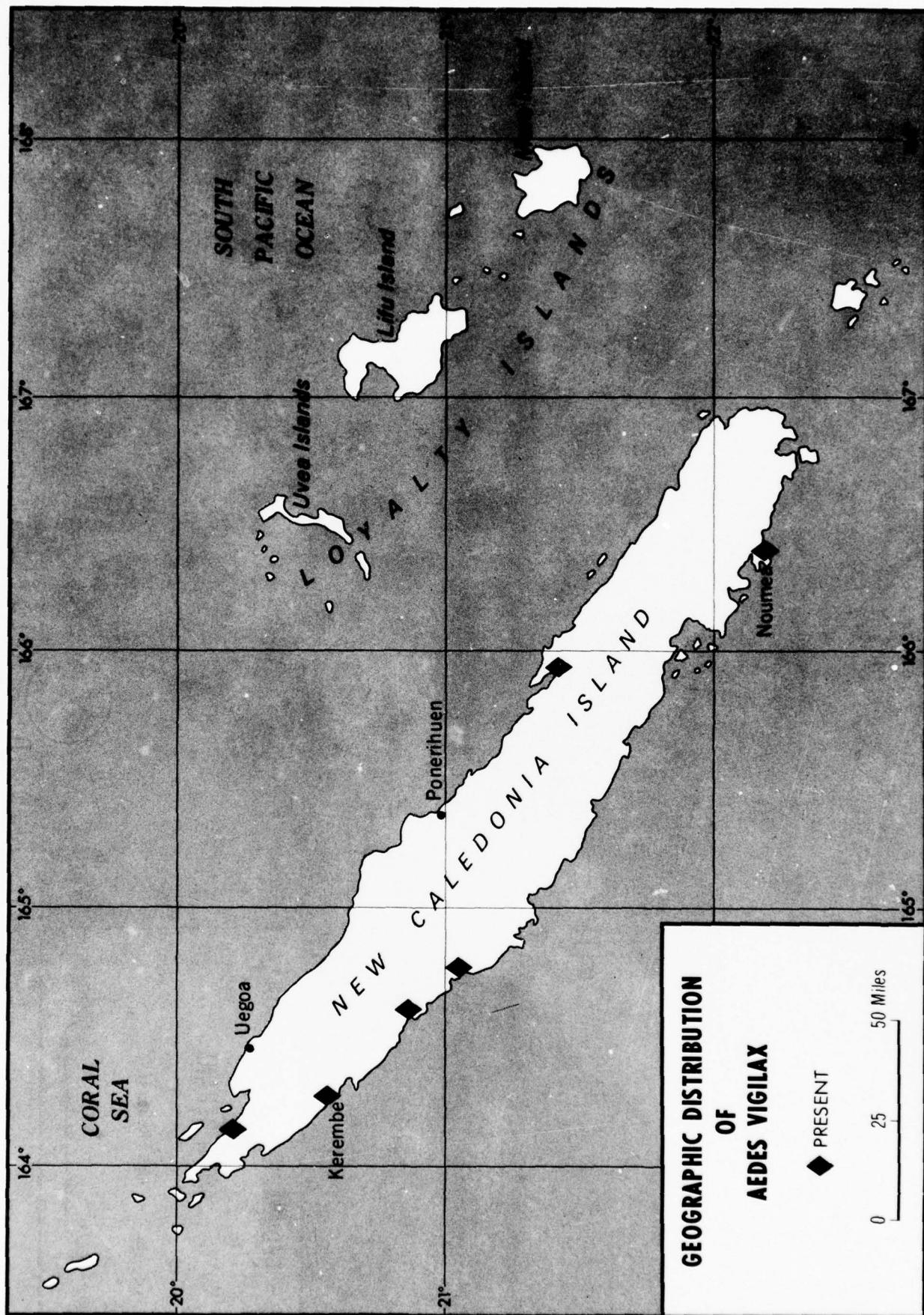
NEW CALEDONIA AND LOYALTY ISLANDS

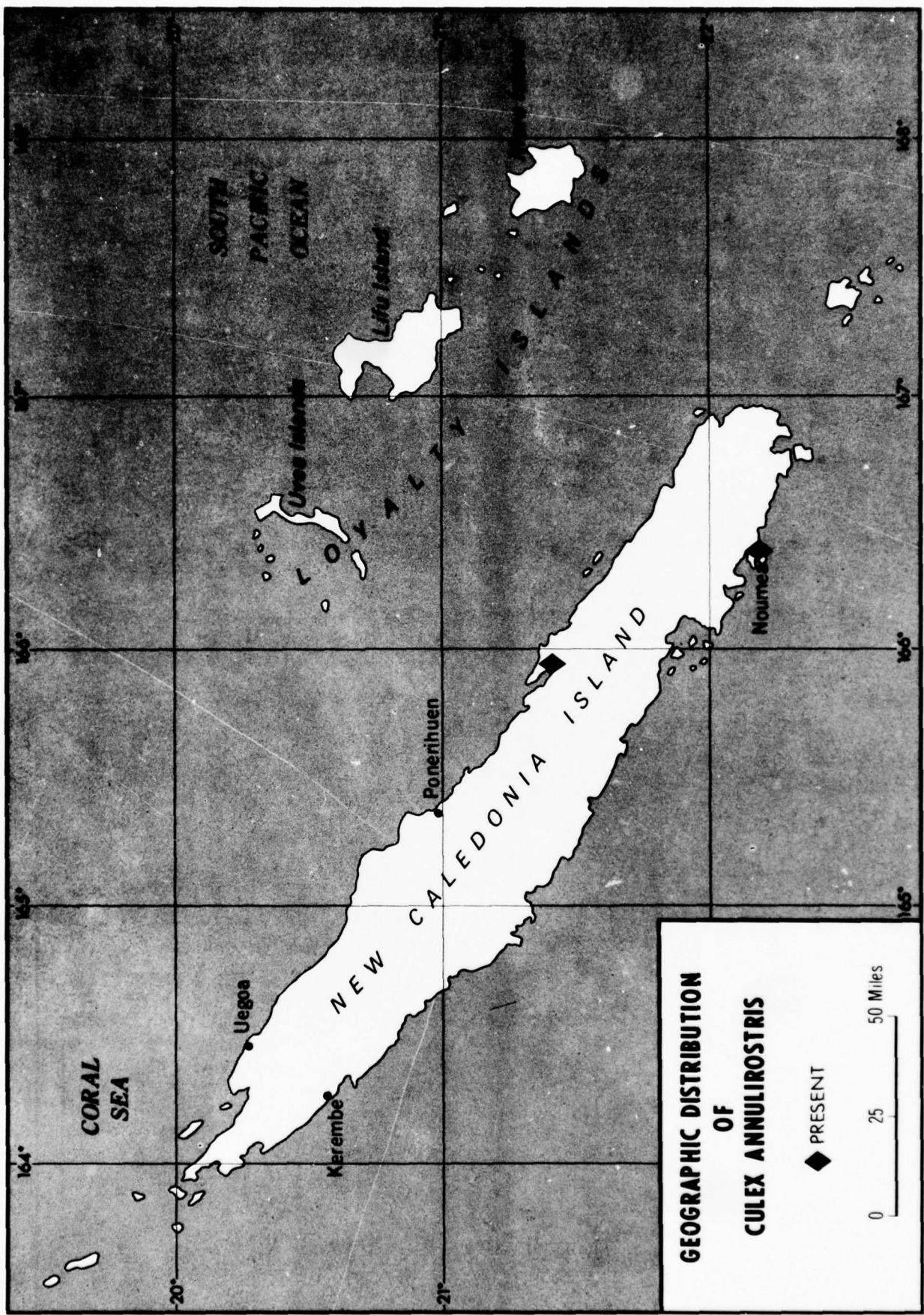


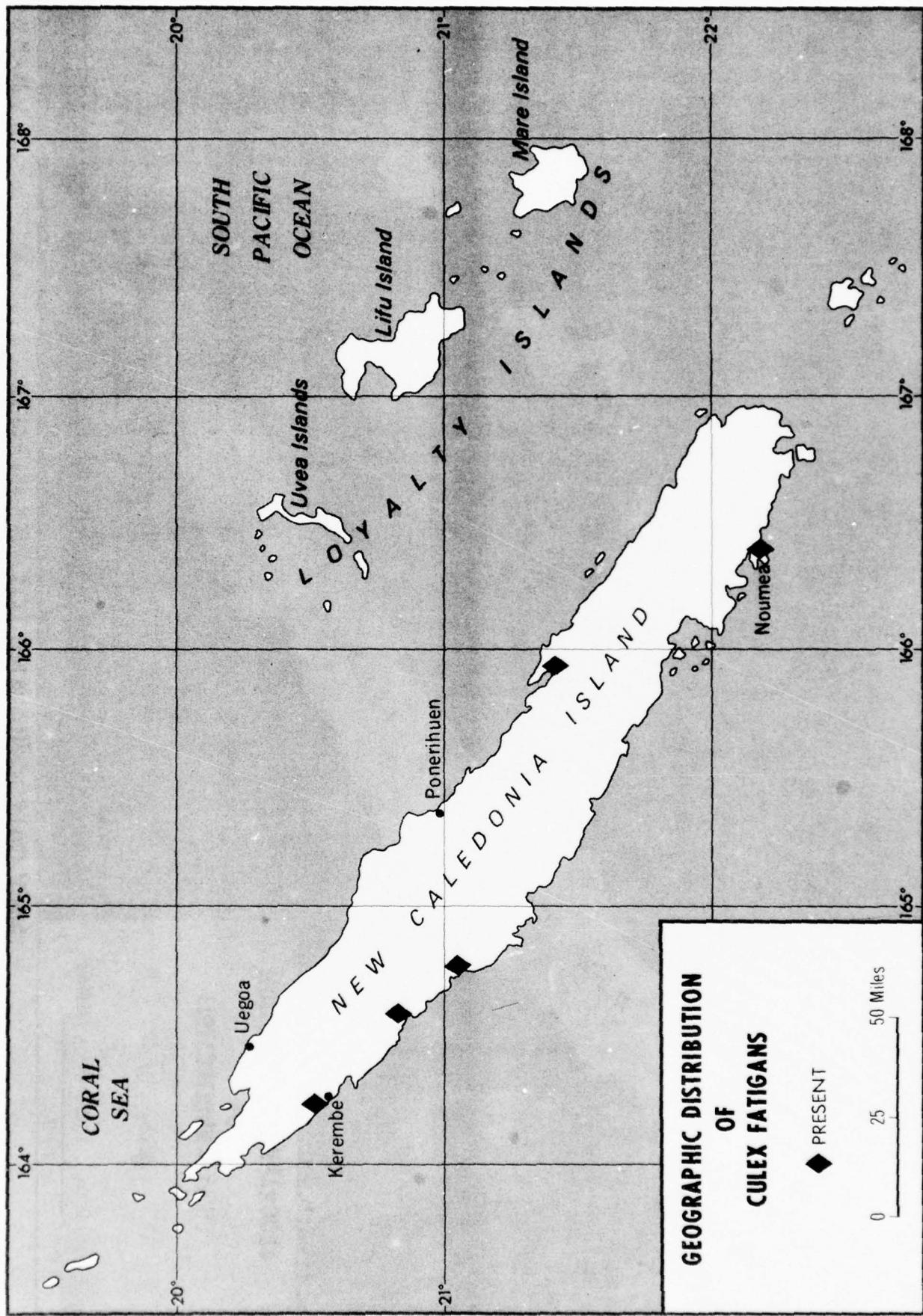


MAP 63

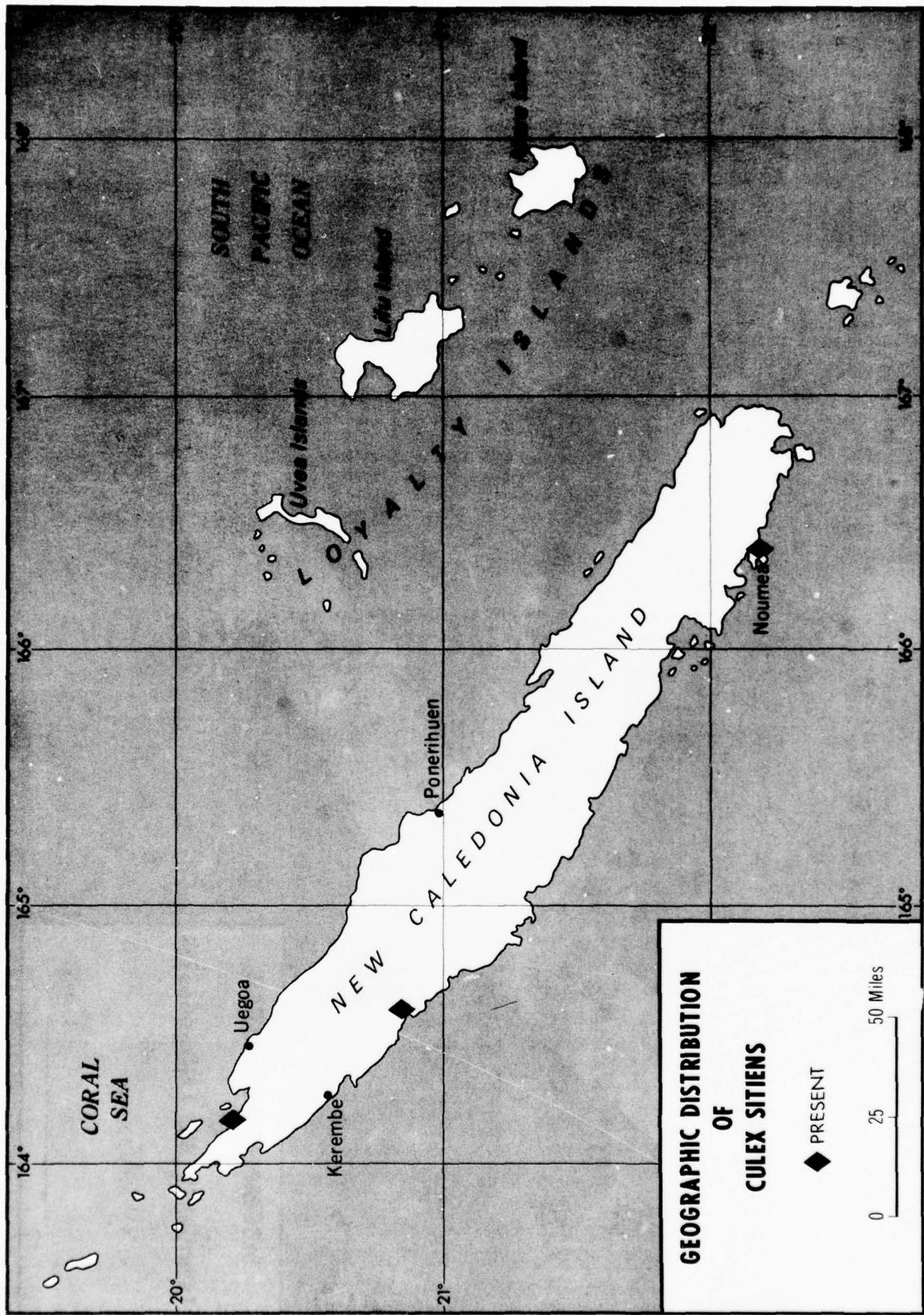
NEW CALEDONIA AND LOYALTY ISLANDS

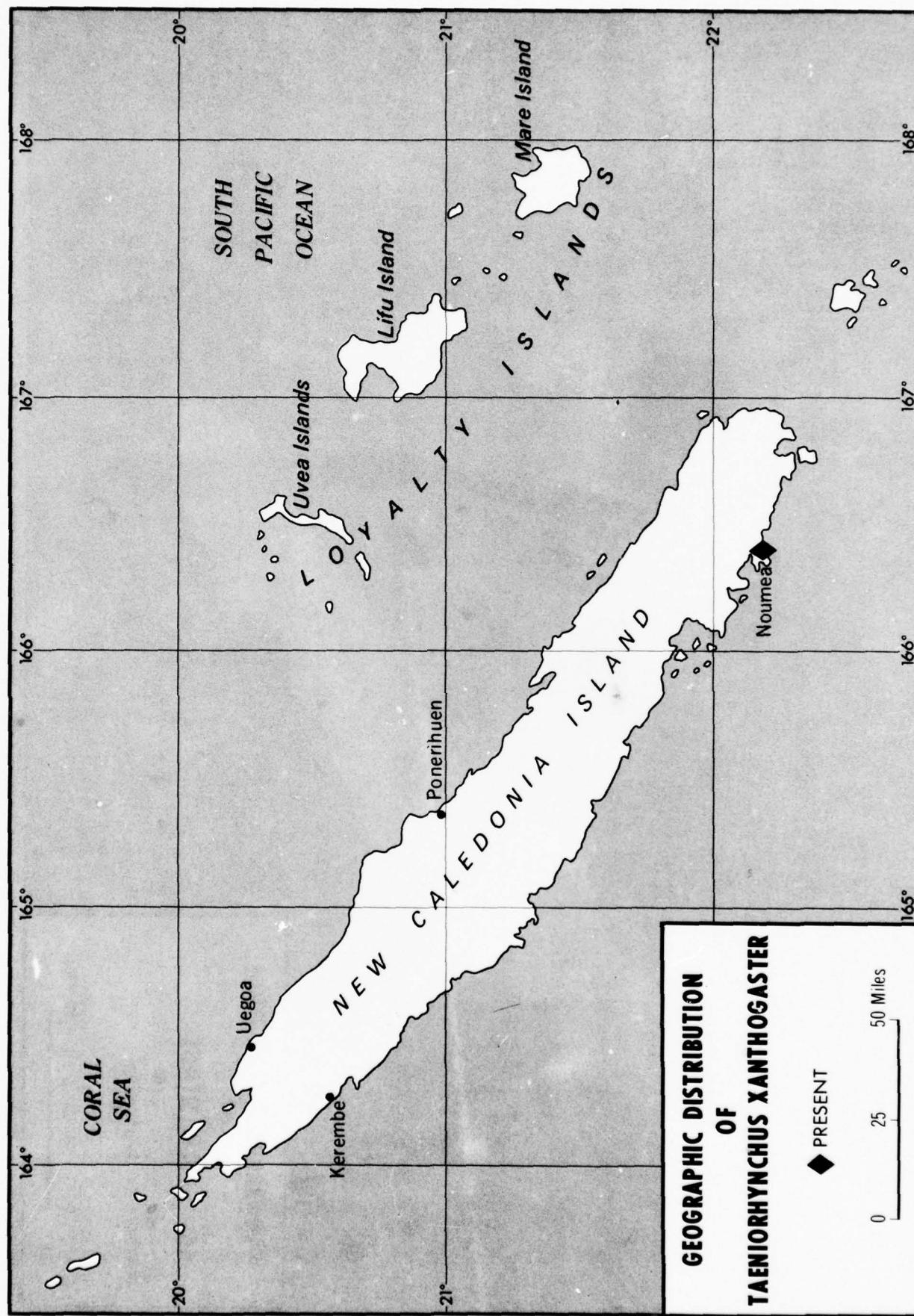






NEW CALEDONIA AND LOYALTY ISLANDS





NEW CALEDONIA AND LOYALTY ISLANDS

MAP 67

BIBLIOGRAPHY

NEW CALEDONIA AND LOYALTY ISLANDS AND HUMAN

<u>Document Number</u>	<u>Source</u>
2025	Perry, William J. 1950. Mosquitoes and mosquito borne disease on New Caledonia, an historic account: 1885-1946. American Journal of Tropical Medicine 30: 103-113.
2045	Lacour, M. and J. Rageau. 1975. Enquete epidemiologique et entomologique sur la filariose de bancroft en Nouvelle Caledonie et dependances. South Pacific Commission Technical Paper. #110: 1-25.
2048	Backhouse, T. C. and A. R. Woodhill. 1956. Further studies on the hospitality of some <i>Scutellaris</i> group and other mosquitoes towards <i>Wuchereria bancrofti</i> . from New Caledonia. South Pacific Commission Technical Paper. #17: 1-4.

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NEW CALEDONIA AND LOYALTY ISLANDS AND MOSQUITO

<u>Document Number</u>	<u>Source</u>
2025	Perry, William J. 1950. Mosquitoes and mosquito borne disease on New Caledonia, an historic account: 1885-1946. American Journal of Tropical Medicine 30: 103-113.
2042	World Health Organization Regional Office for the Western Pacific and the South Pacific Commission. 1968. Second WHO/SPC joint seminar on filariasis. Final report. Wld. Hlth. Org. Monogr. Ser. #WPR/350/68: 1-44.
2045	Lacour, M. and J. Rageau. 1957. Enquete epidemiologique et entomologique sur la filariose de bancroft en Nouvelle Caledonie et dependances. South Pacific Commission Technical Paper. #110: 1-25.
2048	Backhouse, T. C. and A. R. Woodhill. 1956. Further studies on the hospitality of some <u>Scutellaris</u> group and other mosquitoes towards <u>Wuchereria bancrofti</u> from New Caledonia. South Pacific Commission Technical Paper. #17: 1-4.
2081	Iyengar, M. O. T. and M. A. U. Menon. 1956. Studies on filariasis in New Caledonia. South Pacific Commission Technical Paper. #15: 1-3.
2104	Iyengar, M. O. T. 1955. Filariasis investigations in New Caledonia. South Pacific Commission Quarterly Bulletin. 27 and 34.

K. Wallis Islands

1. Human Data

In the articles extracted in the Disease Information System, there is evidence that either mosquito control or treatment measures have been undertaken. The latest and only survey in the System was done from October, 1958 to February, 1959. The prevalence rates are presented in Map 68.

2. Mosquito Data

Information on the role, the habitat, the breeding and biting habits, etc. is presented in Table 18. Information on the geographic distribution of Aedes polynesiensis is presented in Map 69.

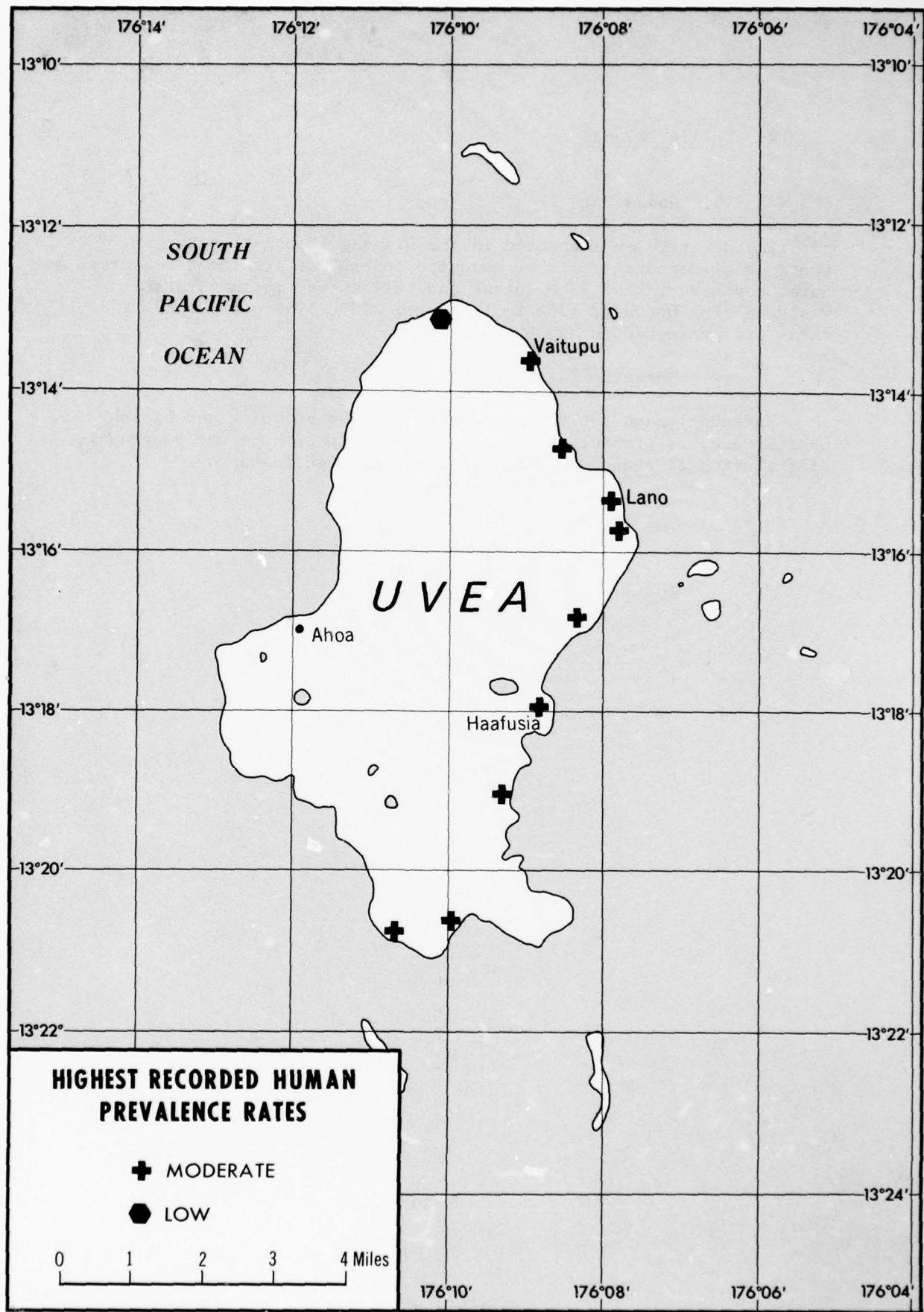
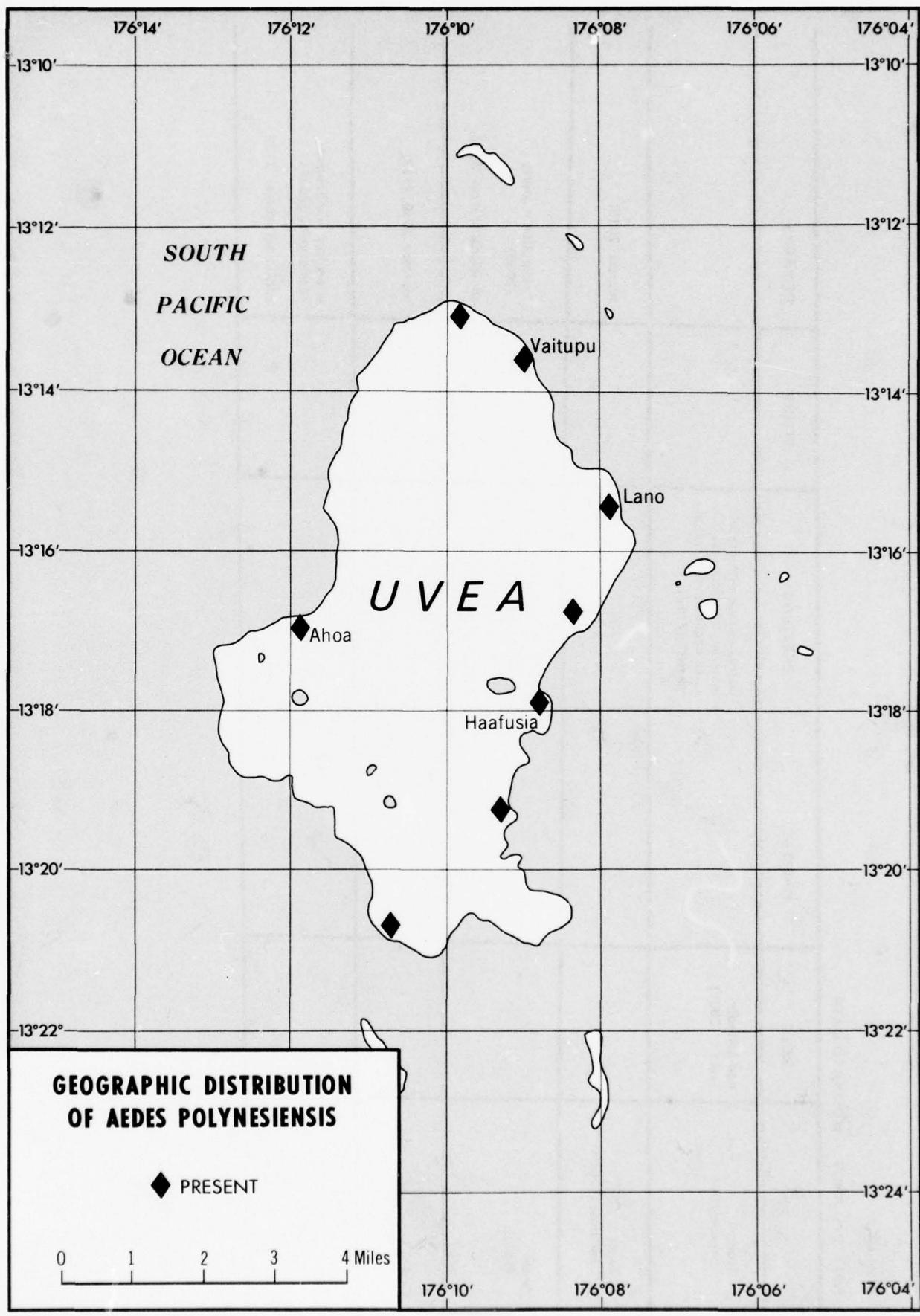


Table 18
WALLIS ISLANDS — MOSQUITO DATA

	ROLE	HABITAT	BREEDING	BITING	REMARKS
* <i>Aedes polynesiensis</i>	non-periodic vector. (2036)	water in shade with organic material, tree holes, rat eaten coconuts, rain water barrels. (2112)			
* <i>Aedes pseudoscutellaris</i>				source: 2030.	
<i>Aedes aegypti</i>			only occasionally extensive. (2030)		distribution = spotty (2030) additional source: 2122.
<i>Culex annulirostris</i>					sources: 2030, 2122.
<i>Culex fatigans</i>					a few foci in inhabited coastal area. (2030) additional source: 2122.

* Major Vector



WALLIS ISLANDS

BIBLIOGRAPHY

WALLIS ISLANDS AND HUMAN

<u>Document Number</u>	<u>Source</u>
2030	Byrd, Elon E. and Lyle S. St. Amant. 1959. Studies on the epidemiology of filariasis on Central and South Pacific islands. South Pacific Commission Technical Paper. #125: 1-96.
2122	Rageau, Jean. 1959. Enquete sur la filariose a Wallis. Institut Francais d'Oceanie. 1-37.

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WALLIS ISLANDS AND MOSQUITO

<u>Document Number</u>	<u>Source</u>
2030	Byrd, Elon E. and Lyle S. St. Amant. 1959. Studies on the epidemiology of filariasis on Central and South Pacific islands. South Pacific Commission Technical Paper. #125: 1-96.
2036	Manson-Bahr, Philip and W. J. Muggleton. 1952. Further research on filariasis in Fiji. Trans. Roy. Soc. Trop. Med. Hyg. 46 (3): 301-326.
2122	Rageau, Jean. 1959. Enquete sur la filariose a Wallis. Institut Francais d'Oceanie. 1-37.

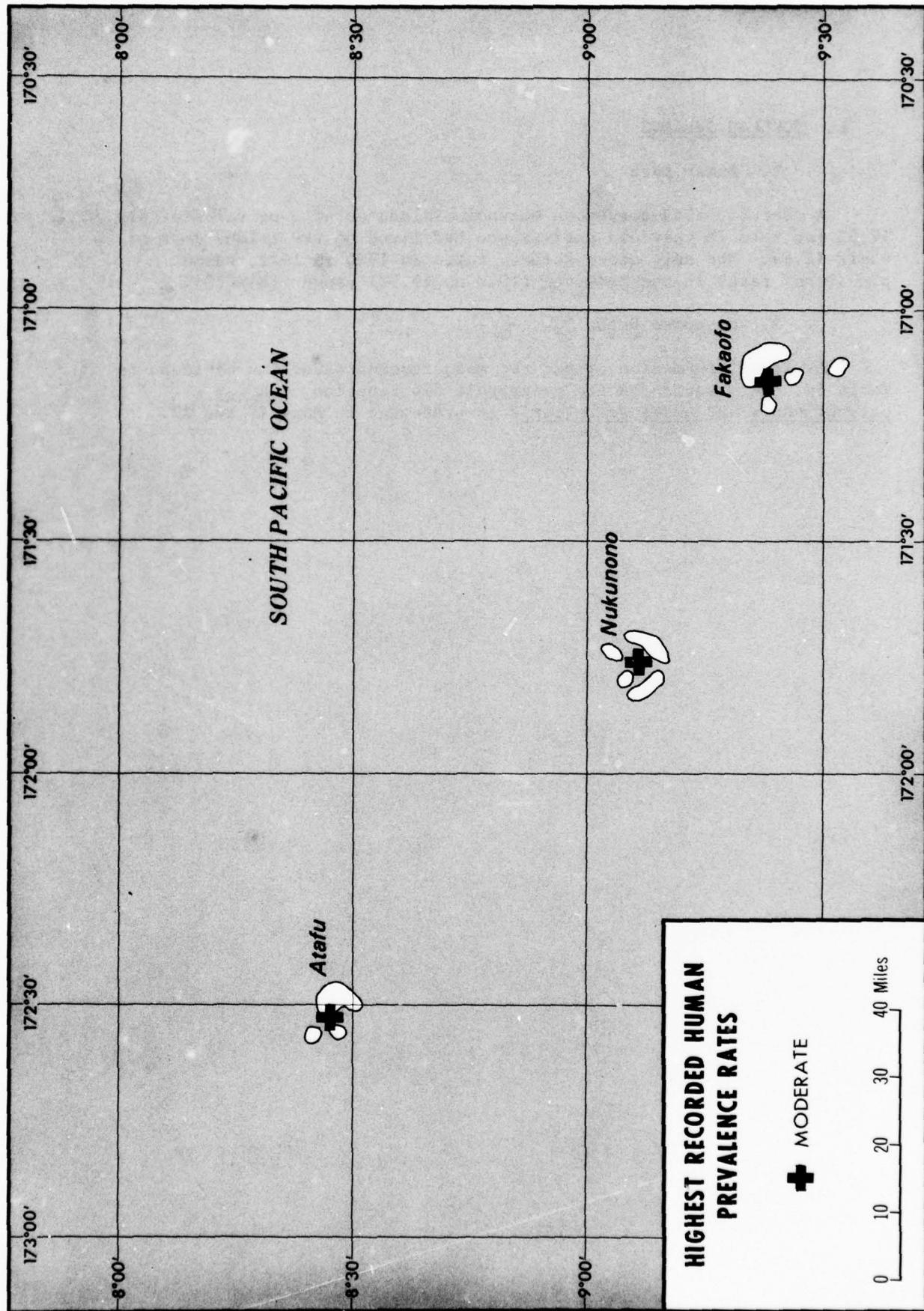
L. TOKELAU ISLANDS

1. Human Data

A June 15, 1953 survey on Mukunono Island noted a prevalence rate of 17.5% for 5 to 78 year old natives who had lived on the island most of their lives. The only other survey, taken in 1920 to 1921, noted prevalence rates in the moderate (10.0 to 49.9%) range (Map 70).

2. Mosquito Data

Limited information on the two mosquitoes present can be found in Table 19. Information on the geographic distribution of Aedes polynesiensis and Aedes scutellaris is presented in Maps 71 and 72.

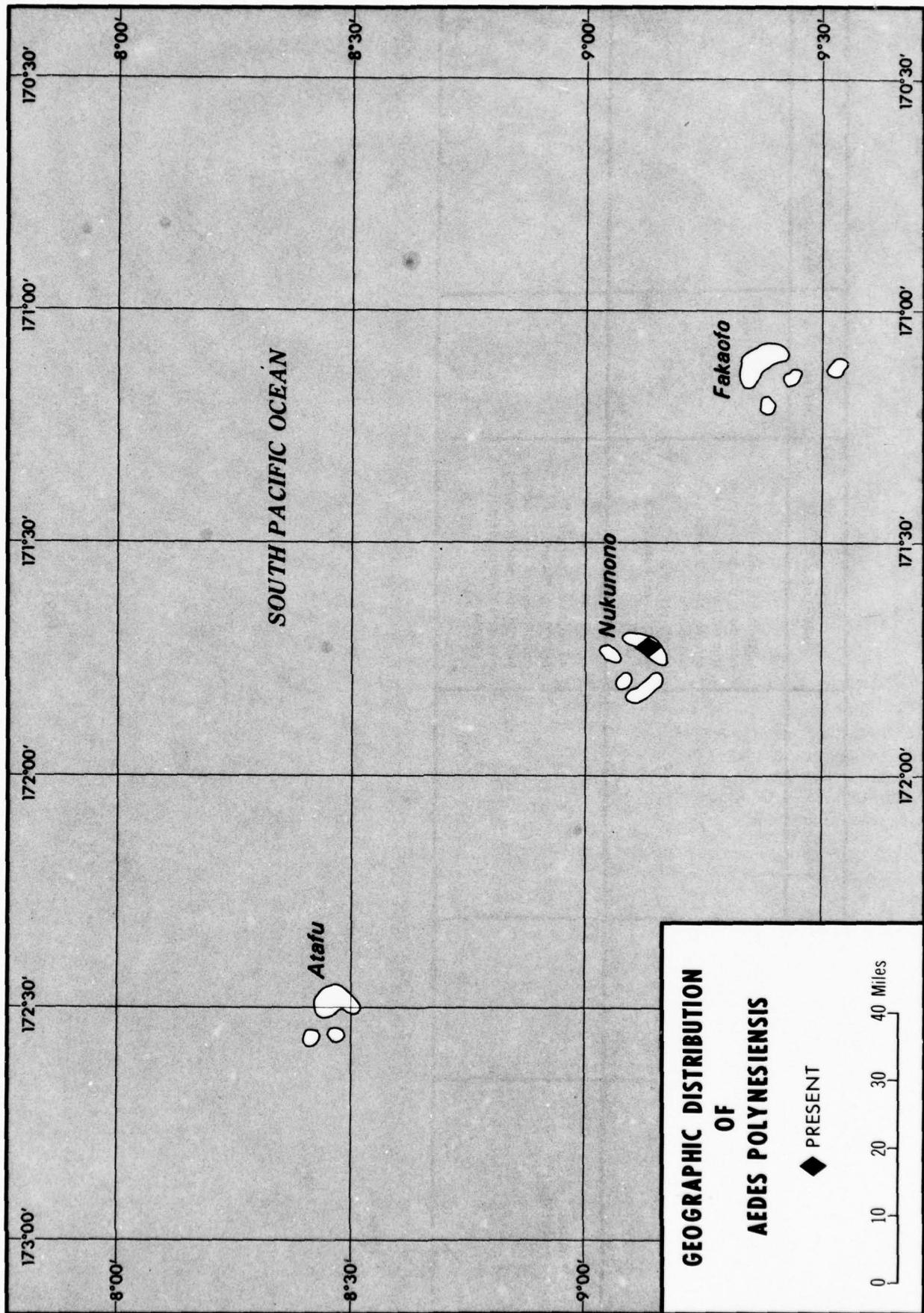


TOKELAU ISLANDS

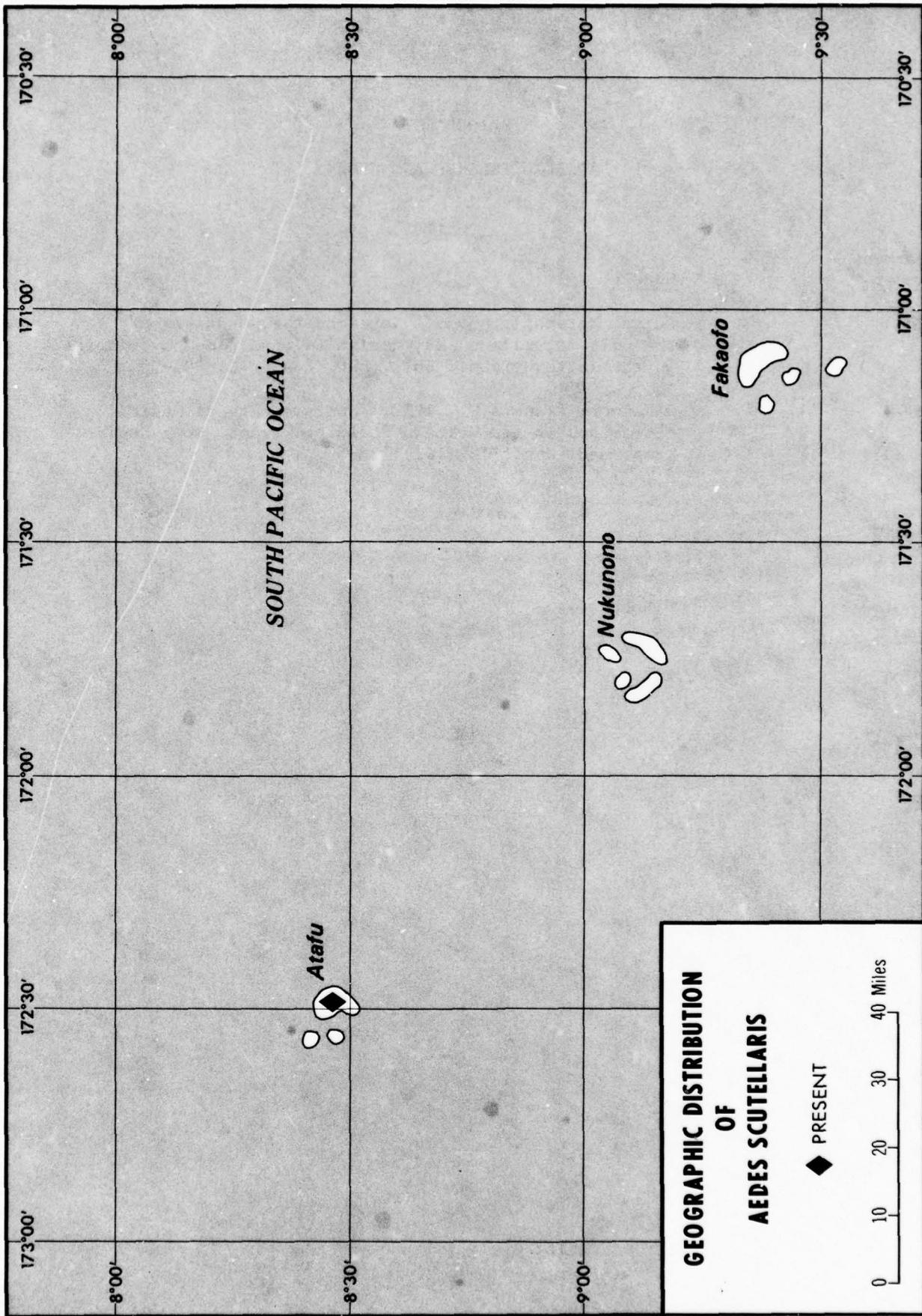
Table 19
TOKE LAU ISLANDS - MOSQUITO DATA

	ROLE	HABITAT	BREEDING	BITING	REMARKS
* <i>Aedes polynesiensis</i>	non-periodic vector. (2036)		water catchment hollows in coconuts, tree trunks, puka tree rot holes and beached canoes. all sites shaded. water temperature = 26.3 to 27°C. pH = 6.0 to 7.6, puka tree rot holes = 6.8. (2080)		
* <i>Aedes scutellaris</i>			44 gallon rain barrels at pH 7.0 and 6.4 and temperature of 28°C. barrels had ill-fitting wooden covers and were close to the house. (2080)		

* Major Vector



**GEOGRAPHIC DISTRIBUTION
OF
AEDES POLYNESIENSIS**



BIBLIOGRAPHY

TOKELAU ISLANDS AND HUMAN

<u>Document Number</u>	<u>Source</u>
2080	Laird, Marshall. 1955. Notes on the mosquitos of the Gilbert, Ellice and Tokelau Islands, and on filariasis in the latter group. Bull. Ent. Res. 46: 291-300.
2095	O'Connor, Francis W. 1922. Some results of medical researches in the Western Pacific. Trans. Roy. Soc. Trop. Med. Hyg. 16 (1&2): 28-56.

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TOKELAU ISLANDS AND MOSQUITO

Document
Number

2080

Source

Laird, Marshall. 1955. Notes on the mosquitos of the Gilbert, Ellice and Tokelau Islands, and on filarias in the latter group. Bull. Ent. Res. 46: 291-300.

1. Niue Island

1. Human Data

Sub-periodic bancroftian filariasis has been endemic in Niue Island. A 1954 survey revealed a MF rate of 22.1%. A MDA program was initiated in 1956 and by 1957 the MF rate (by standard blood film examination) had diminished to 3%. By 1972, the MF rate, as determined by a WHO team, had risen to 16.3% and a new MDA campaign was undertaken.

2. Mosquito Data

The main vector is reputed to be Aedes cooki (Table 20).

Table 20
NIUE ISLAND — MOSQUITO DATA

	ROLE	HABITAT	BREEDING	BITING	REMARKS
* <i>Aedes cooki</i>	suspected vector. (2053)		rain water containers, coconut shells, tins. (2053)		
* <i>Aedes scutellaris</i>		village and bush. (2053)	domestic containers for rain water storage, tin cans, coconut shells, no rat damaged coconuts. (2053)		
* <i>Aedes tongae-niue</i>	assumed vector. (2053)	outdoor resting. (2053)			population comparatively rare. (2053)
<i>Culex sitiens</i>			small rock pools of brackish or saline water, breeding places restricted to cliffs overhanging the sea coast. (2053)		

* Major Vector

BIBLIOGRAPHY

NIUE ISLAND AND HUMAN

<u>Document Number</u>	<u>Source</u>
2038	Kessel, John F. and Emile Massal. 1962. Control of bancroftian filariasis in the Pacific. Bull. Wld. Hlth. Org. 27: 543-554.
2053	Iyengar, M. O. T. 1953. Investigation on filariasis in Niue. South Pacific Commission Technical Paper. #30: 1-10.
2110	Simpson, E. J. B. 1957. Mass therapy in filariasis. Note on control in Niue Island. N. Z. Med. Jour. 56: 136-137.
2125	Maung, Tin Maung. 1974. Filariasis control by the application of mass drug administration in Western Samoa, Ellice Islands and Niue. Wld. Hlth. Org. Monogr. Ser. #WPR/FIL/11: 1-6.

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NIUE ISLAND AND MOSQUITO

<u>Document Number</u>	<u>Source</u>
2042	World Health Organization Regional Office for the Western Pacific and the South Pacific Commission. 1968. Second WHO/SPC joint seminar on filariasis. Final report. Wld. Hlth. Org. Monogr. Ser. #WPR/350/68 1-44
2053	Iyengar, M. O. T. 1958. Investigation of filariasis in Niue. South Pacific Commission Technical Paper. #30: 1-10.
2125	Maung, Tin Maung. 1974. Filariasis control by the application of mass drug administration in Western Samoa, Ellice Islands and Niue. Wld. Hlth. Org. Monogr. Ser. #WPR/FIL/11: 1-6.

N. New Hebrides

1. Human Data

The most extensive surveys were done in 1943 and 1944. The most recent survey was done in 1966 and 1967 on Santa Marie, Banks Islands and Torres Islands. Geographic distribution of the human prevalence rates can be found in Map 73. Prevalence rates vary; in the Maskelynes, the rate was 3%, while in the Southwest Bay Area it was 65%.

2. Mosquito Data

Information on the role and the bionomics can be found in Table 21. The *W. bancrofti* is periodic and transmitted mainly by *Anopheles farauti*. The geographic distribution of *Anopheles farauti* is presented in Map 74. The role of *Culex fatigans* as a vector in the New Hebrides is not known.

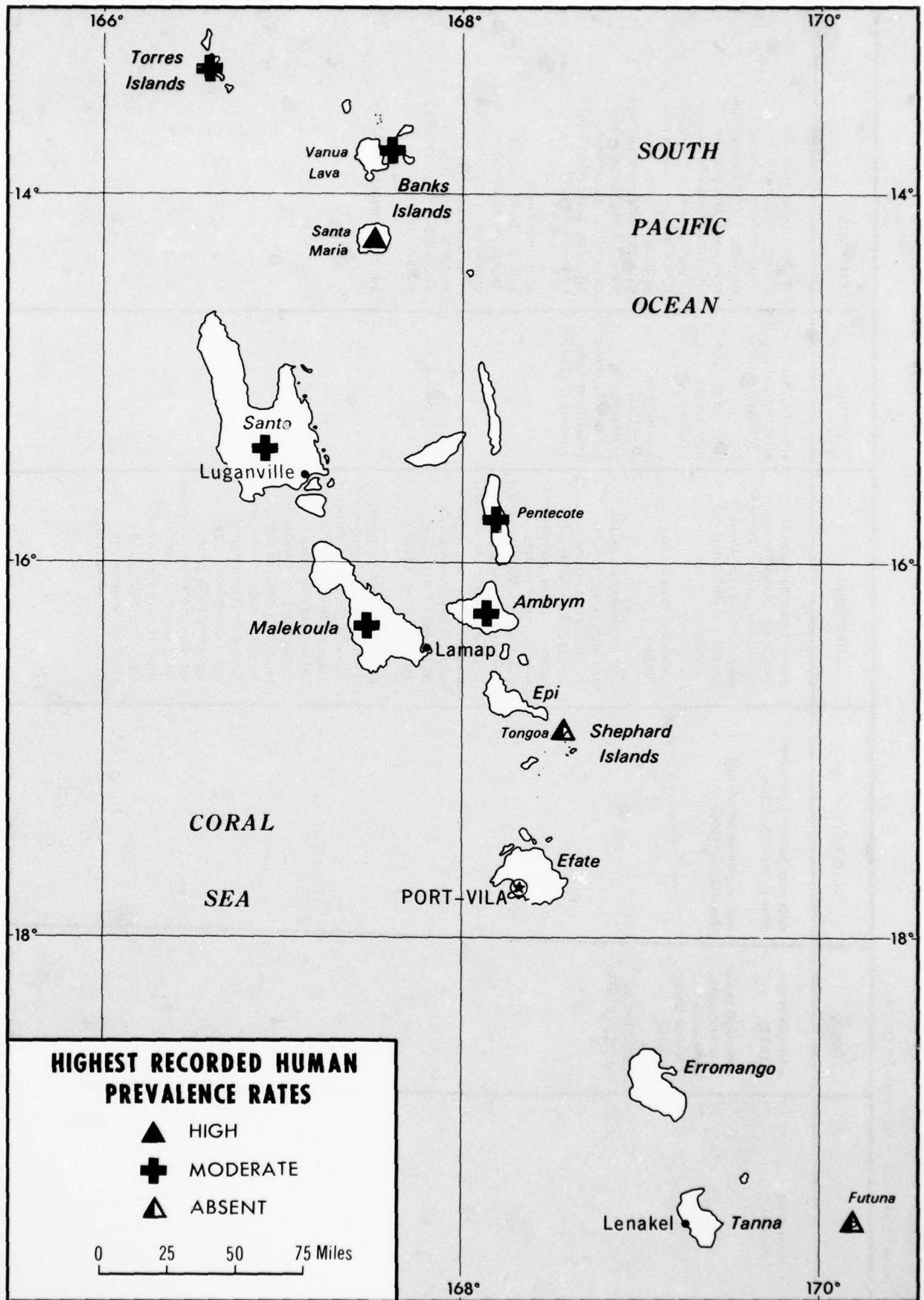


Table 21

NEW HEBRIDES - MOSQUITO DATA

	ROLE	HABITAT	BREEDING	BITING	REMARKS
* <i>Anopheles farauti</i>	principal vector. (2083) presumed vector. only mosquito harbouring infective larvae. (2030) implicated as vector. (2107)	rests near human habitation close to ground. (2030) rests in houses before and after biting. (2083)	along stream banks with vegetation, in hoof prints, ditches, wheel ruts, some open sunlight may enhance breeding in still water. (2030) near edges exposed to sun. (2083)	sporadic, mainly after rainfall. (2030) bites indoors and out at night. (2083)	abundant at altitude 335 meters. full larval development in up to 65% sea water (13000 parts/million chlorides). late larval to adult development successful in pure sea water (20000 to 23000 parts/million chlorides). at 28 to 30°C length of developmental stages in days -- egg = 1.5 to 2, larvae = 10, pupa = 1.5. quiet flight. estimated flight range = 0.75 to 1 mile. (2107) adults essentially anthropophilic. activity dependent on climatic conditions. most quiet after rain. quiet evenings 1700 to 2000. flight range estimated at 700 to 900 meters. (2109) additional source: 2042.

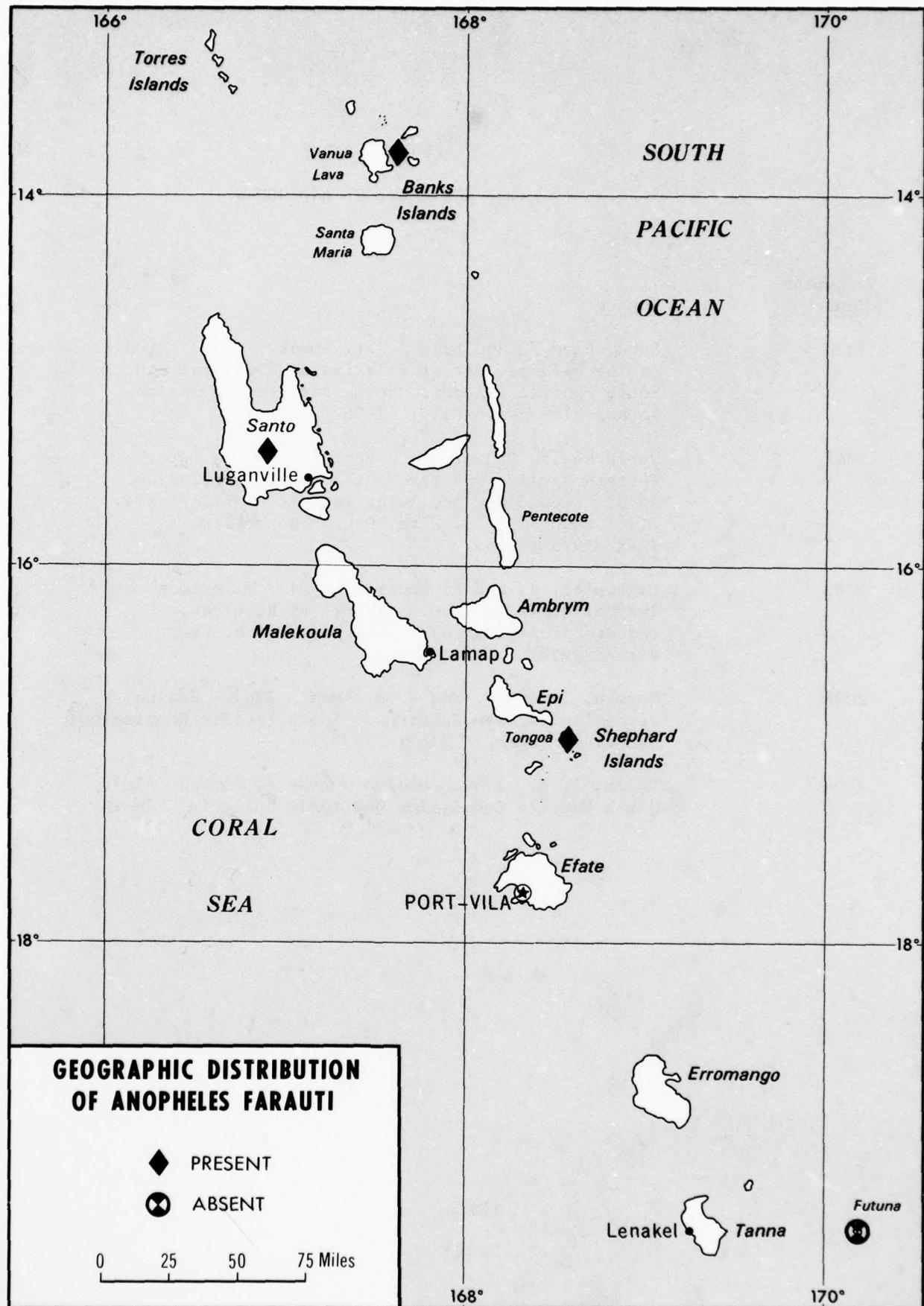
Table 21 cont.

NEW HEBRIDES — MOSQUITO DATA

	ROLE	HABITAT	BREEDING	BITING	REMARKS
* <i>Anopheles farauti</i> (cont.)			breeding sites made by troops. (2107) highest larval counts from sunlit streams and river margins with protective emergent vegetation. (2109)		
<i>Aedes futunae</i>	suspected vector. (2042)				source: 2030.
<i>Aedes aegypti</i>					source: 2030.
<i>Aedes funereus</i>					source: 2030.
<i>Aedes hebrideus</i>					source: 2030.
<i>Aedes vexans</i>					source: 2030.
<i>Culex annulirostris</i>					source: 2030.
* Major Vector					171

Table 21 cont.
NEW HEBRIDES — MOSQUITO DATA

	ROLE	HABITAT	BREEDING	BITING	REMARKS
<i>Culex</i> <i>fatigans</i>					rare. (2030) additional source: 2042.
<i>Culex</i> <i>pacificus</i>					source: 2030.
<i>Culex</i> <i>sitiens</i>					source: 2030.



MAP 74

BIBLIOGRAPHY

NEW HEBRIDES AND HUMAN

<u>Document Number</u>	<u>Source</u>
2030	Byrd, Elon E. and Lyle S. St. Amant. 1959. Studies on the epidemiology of filariasis on Central and South Pacific islands. South Pacific Commission Technical Paper. #125: 1-96.
2042	World Health Organization Regional Office for the Western Pacific and the South Pacific Commission. 1963. Second WHO/SPC joint seminar on filariasis. Final report. Wld. Hlth. Org. Monogr. Ser. #WPR/350/68: 1-44.
2083	Lagraulet, J. and P. Bonnin. 1971. Filariose lymphatique a Mallicolo (Nouvelles Hebrides, enquete preliminaire). Bull. Soc. Path. Exot. #2: 229-231.
2098	Norman, Taylor W. and W. H. Rees. 1964. Health survey in the New Hebrides. South Pacific Commission Technical Paper. #143: 1-38.
2106	Mills, A. R. 1954. Health survey of Futuna Island. South Pacific Commission Quarterly Bulletin. 26-28.

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NEW HEBRIDES AND MOSQUITO

<u>Document Number</u>	<u>Source</u>
2030	Byrd, Elon E. and Lyle S. St. Amant. 1959. Studies on the epidemiology of filariasis on Central and South Pacific islands. South Pacific Commission Technical Paper. #125: 1-96.
2042	World Health Organization Regional Office for the Western Pacific and the South Pacific Commission. 1968. Second WHO/SPC joint seminar on filariasis. Final report. Wld. Hlth. Org. Monogr. Ser. #WPR/350/68: 1-44.
2083	Lagraulet, J. and P. Bonnin. 1971. Filariose lymphatique a Mallicolo (Nouvelles Hebrides, enquete preliminaire). Bull. Soc. Path. Exot. #2: 229-231.
2106	Mills, A. R. 1954. Health survey of Futuna Island. South Pacific Commission Quarterly Bulletin. 26-28.
2109	Perry, William J. 1950. Principal larval and adult habitats of <u>Anopheles farauti</u> lav. in the British Solomon Islands. Mosquito News. 10 (3): 117-126.

0. Solomon Islands

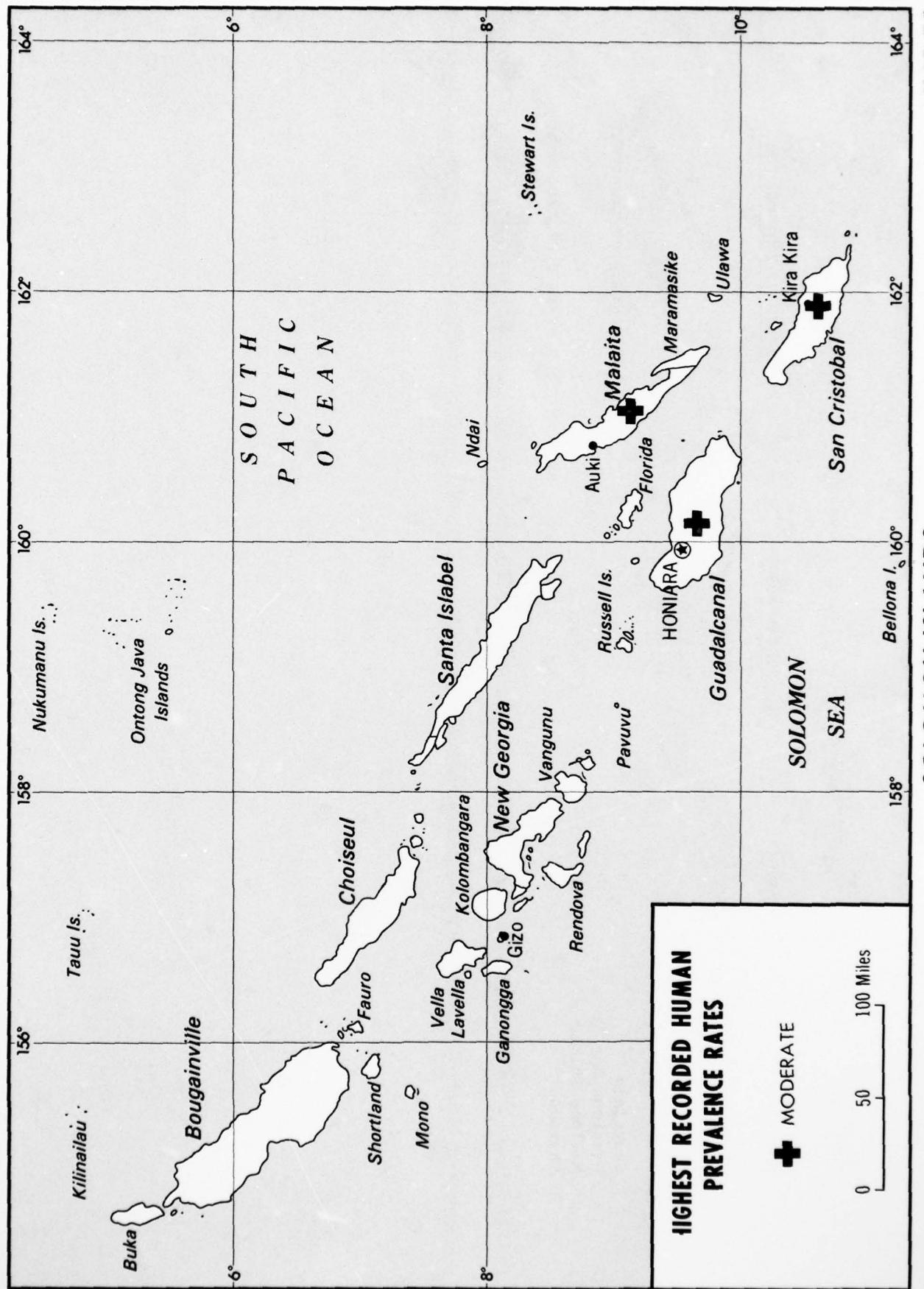
1. Human Data

Treatment measures were started sometime during the 1960's. Mosquito control measures under the malaria eradication program started in 1960 and were extended to all islands in 1972. The geographic distribution of the highest prevalence rates for periodic bancroftian filariasis is presented in Map 75. The most recent prevalence rates can be found in Table 22.

Vector control for malaria initiated in various parts of the Solomon Islands between 1960 and 1968 is believed to have reduced the prevalence of filariasis. (Anopheles farauti, A. punctulatus and A. koliensis transmit both malaria and W. bancrofti.) A 1970 to 1971 blood survey indicated that areas where the control measures had been operative for only 2 to 3 years, such as Choiseul and Guadalcanal, MF rates were still high, 19% and 25% respectively. The MF rate in Guadalcanal was 25% before spraying operations and 19% 3 years after spraying.

2. Mosquito Data

Information on the role and the bionomics can be found in Table 23. The geographic distribution of the various mosquito species is presented in Maps 76 and 92.



MAP 75

Table 22

SOLOMON ISLANDS - Most Recent Prevalence Rates (2147)

<u>LOCATION</u>	<u>DATE</u>	<u>PREVALENCE</u>	<u>TREATMENT INFORMATION</u>
Solomon Islands	1974	varies from 0 to 80% est. 16.1% of total population affected	
Shortland	1972	0.3%	10 years post treatment
Gracious Bay Area	1973	2.7	
Bellona Island	1973	Absent	
Choiseul	1974	5.2	4 years post treatment

Table 23
SOLOMON ISLANDS — MOSQUITO DATA

	ROLE	HABITAT	BREEDING	BITING	REMARKS
* <i>Anopheles farauti</i>	assumed vector based on epidemiology, previous studies, highest prevalence of developing larvae. (2058) infection up to 50% with <u>W. bancrofti</u> on <u>Guadalcanal</u> . (2109)	limited to perimeter of Soala Lake and exposed m margins of Soala stream. (2058)	highest larval counts from sunlit streams and river m margins with protective emergent vegetation. (2109)	numerous long winding sluggish streams with marginal vegetation. lagoons and swamps at stream outlets, ponds formed by flood water diversion of draining stream path. ruts in compact top soil from vehicles. (Guadalcanal) limestone pockets along stream beds especially during dry periods. bomb and shell craters of temporary importance. (Florida Islands) numerous small streams. during drier periods potholes in limestone water courses were major source. (Russell Islands) extensive swamp areas surrounding Munda Point. spread to bomb craters and shell holes. (New Georgia Group) along margins of large streams, flat coastal stream mouths, vehicle depressions and manholes. (Bougainville) (2109)	adults essentially anthropophilic. activity dependent on climatic conditions. most active after rains, quiet evenings, 1700 to 2000, flight range = estimated 700 to 900 meters. (2109)

* Major Vector

Table 23 cont.

SOLOMON ISLANDS — MOSQUITO DATA

	ROLE	HABITAT	BREEDING	BITING	REMARKS
* <i>Anopheles koliensis</i>	important localized vector. (2109)				additional source: 2030.
* <i>Anopheles punctulatus</i>	may be responsible for universal endemicity rather than hyper-endemicity for which <u>Aedes kochi</u> may be responsible. (2103)				additional source: 2030.
<i>Aedes albifilbris</i>			tree holes, coral pools with organic matter. (2058)		
<i>Aedes albolineatus</i>			tree holes, coconut shells, tin cans, coral pockets. (2058)		
<i>Aedes imprimens</i>					source: 2030.
<i>Aedes kochi</i>					coincides with hyperendemic foci and may be responsible. (2103)
* Major Vector					180

AD-A063 365

HAWAII UNIV HONOLULU DEPT OF TROPICAL MEDICINE AND M--ETC F/G 6/5
A BIOMETRIC STUDY OF FILARIASIS 'WUCHERERIA BANCROFTI' IN THE S--ETC(U)
JUN 76 R S DESOWITZ

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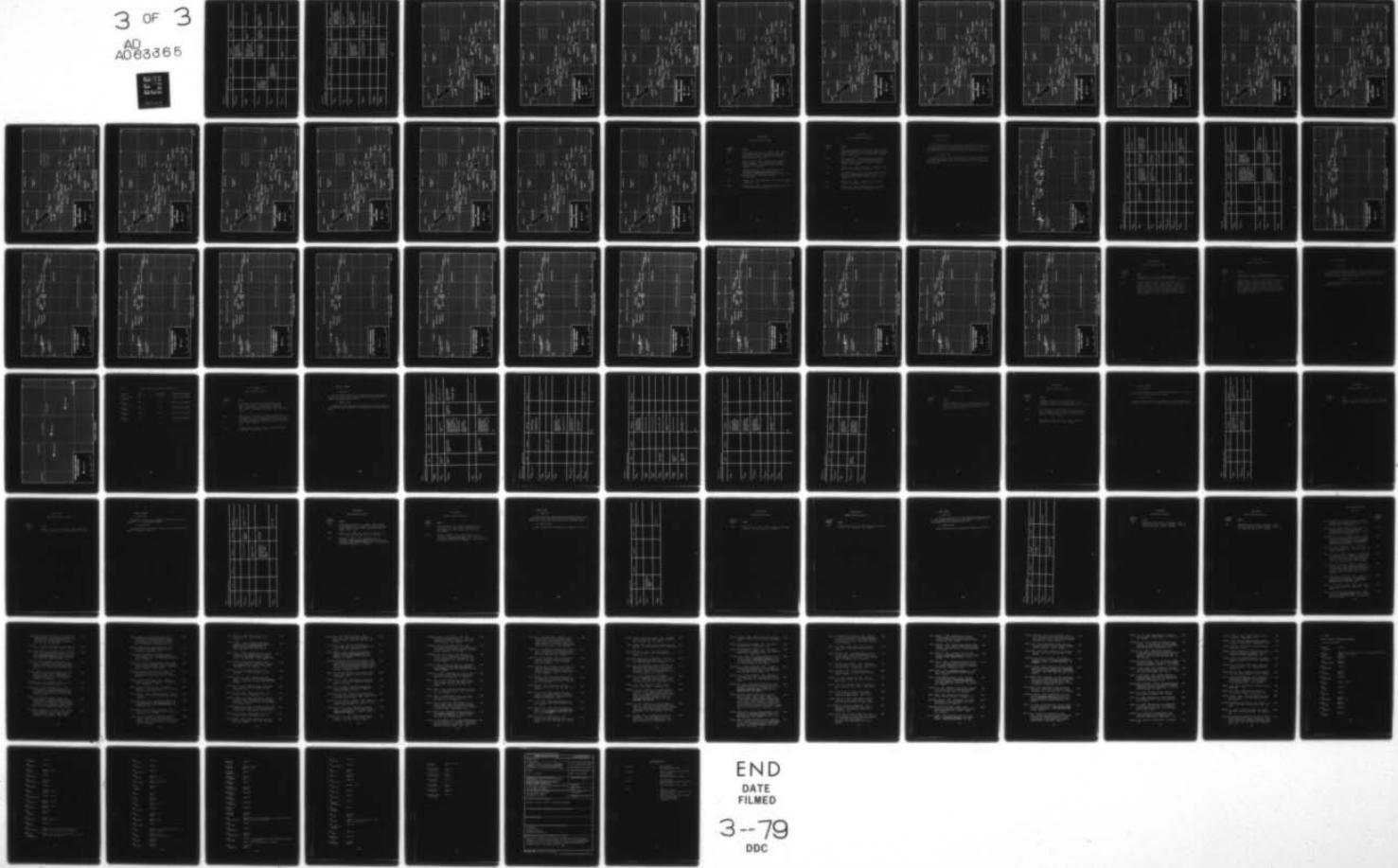
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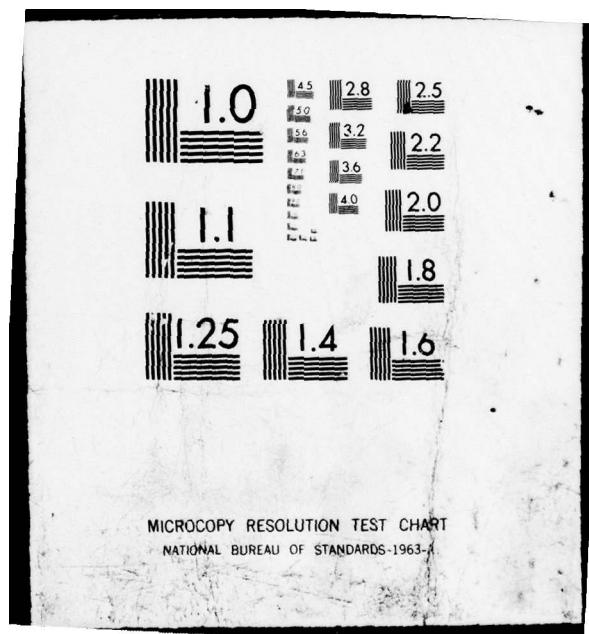
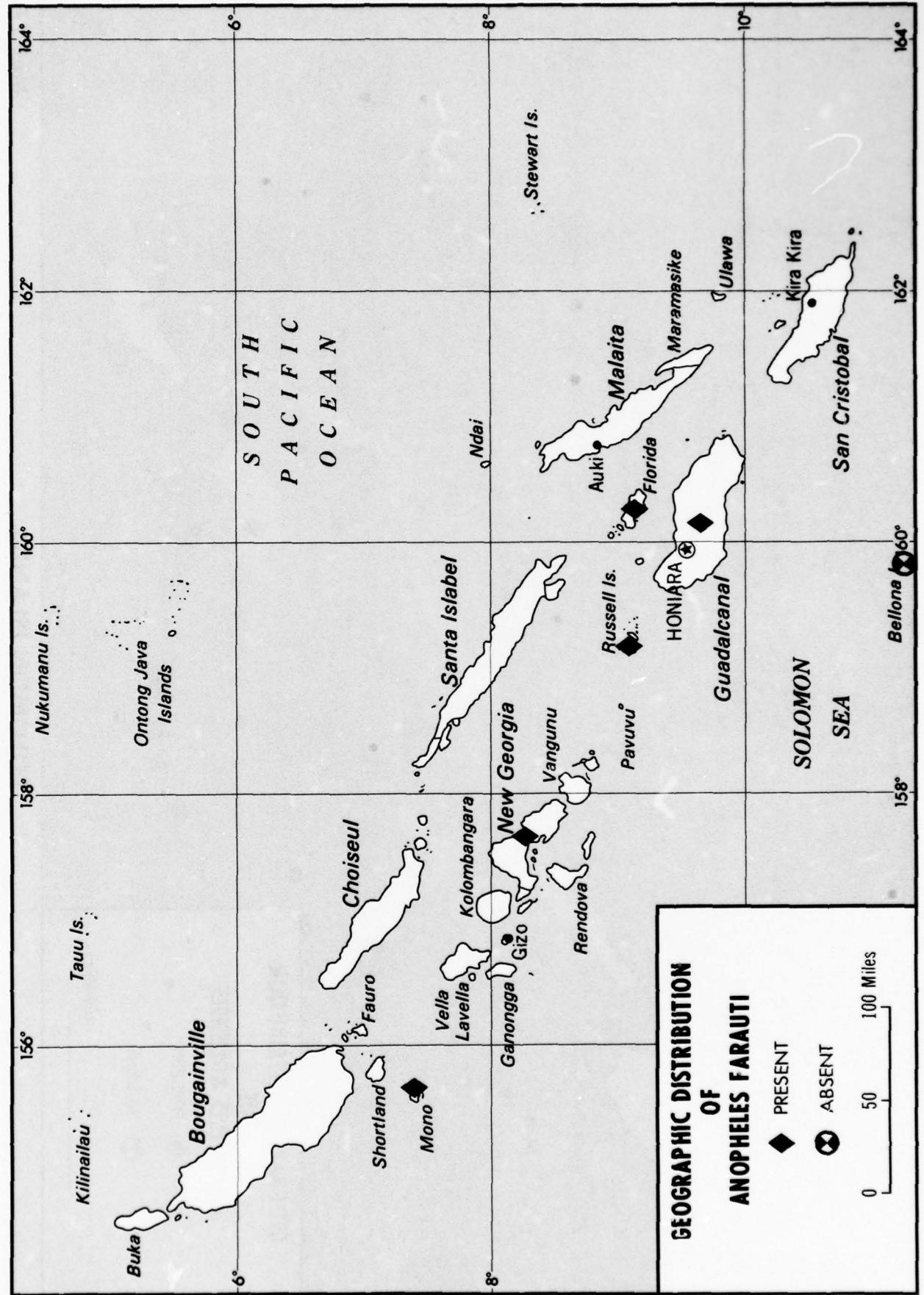


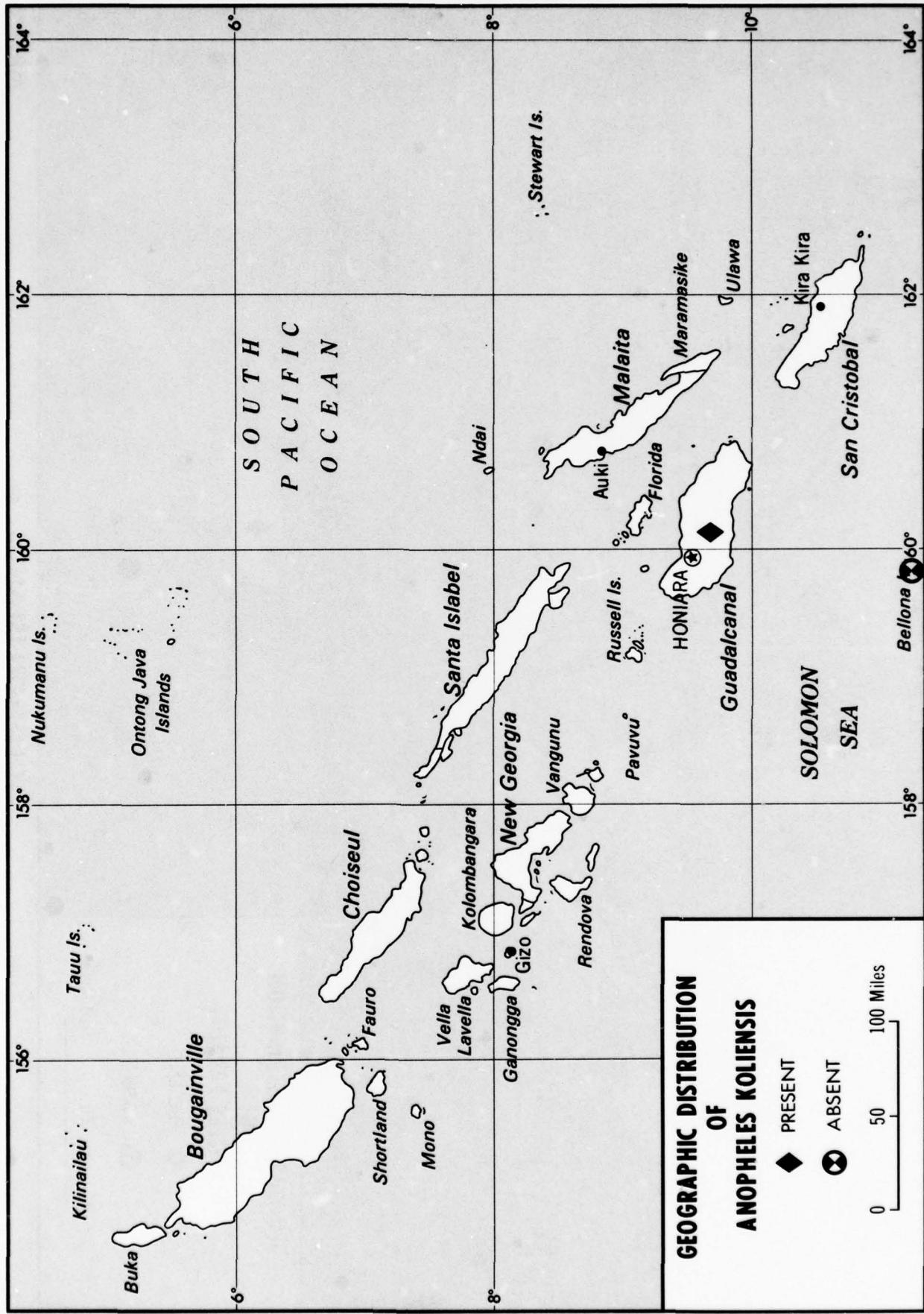
Table 23 cont.
SOLOMON ISLANDS — MOSQUITO DATA

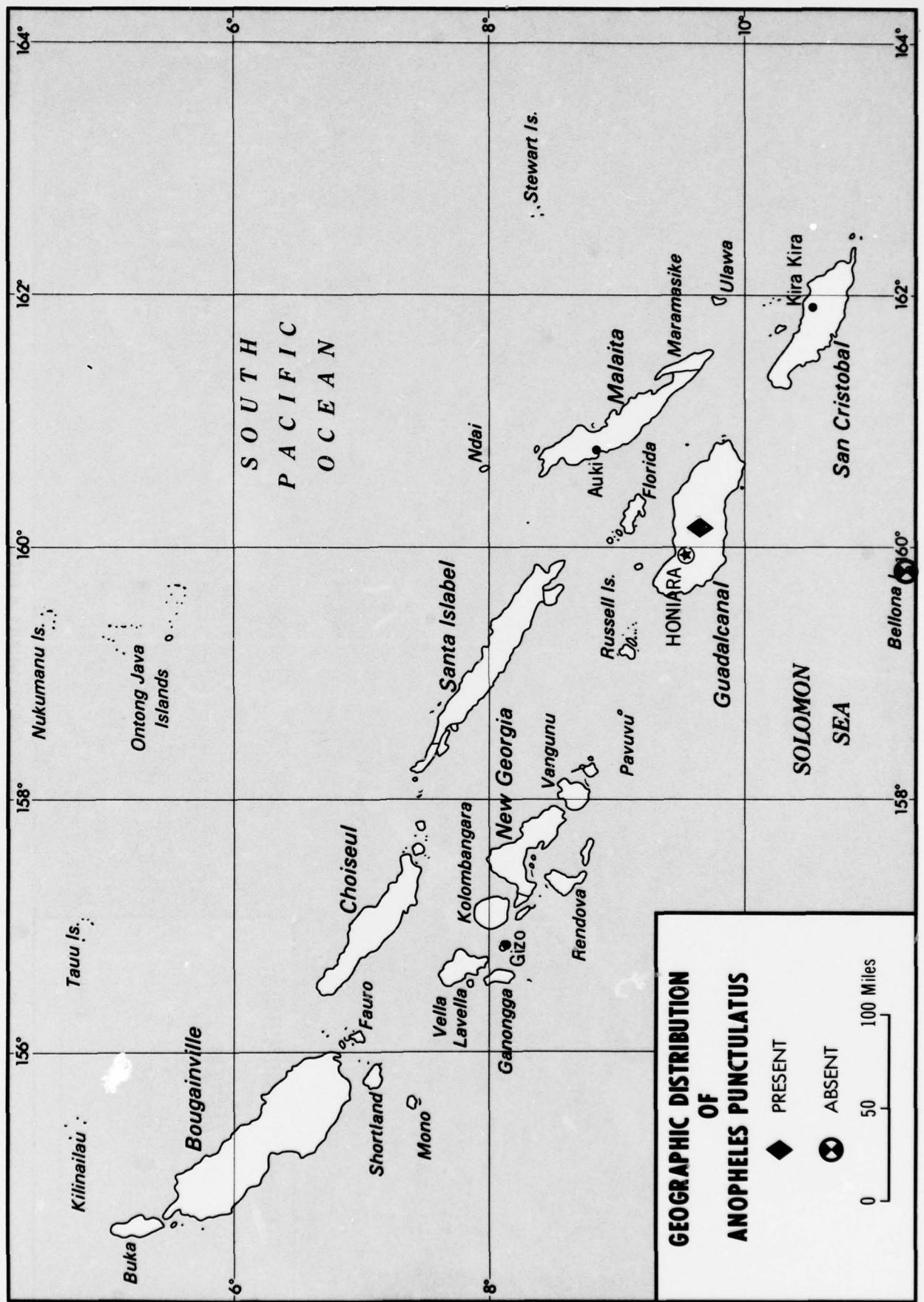
ROLE	HABITAT	BREEDING	BITING	REMARKS
<i>Aedes quasiscutellaris</i>	all types of artificial containers, tree holes, coral pockets with water and high organic content. (2058)			additional source: 2030.
<i>Armigeres breinli</i>		stagnant water of putrefying coconut husks, hollow trunks of bamboo and sago palm. semi-mangrove scrub along coast. (2058)	vicious day biter. (2058)	
<i>Culex annulirostris</i>		ground pools, road ruts, hoof prints, hog wallow containing fresh, brackish or foul water. (2058)	persistent biter in early evening and morning hours. (2058)	widely distributed throughout the islands. (2058)
<i>Culex fatigans</i>	experimental infection successful but no infective stage larvae after 15 days. (2058)			additional source: 2030.
<i>Culex fraudatrix</i>		has ability to take advantage of changing conditions and to develop DDT resistant strains. (2147)		population rare. (2058)

Table 23 cont.
SOLOMON ISLANDS — MOSQUITO DATA

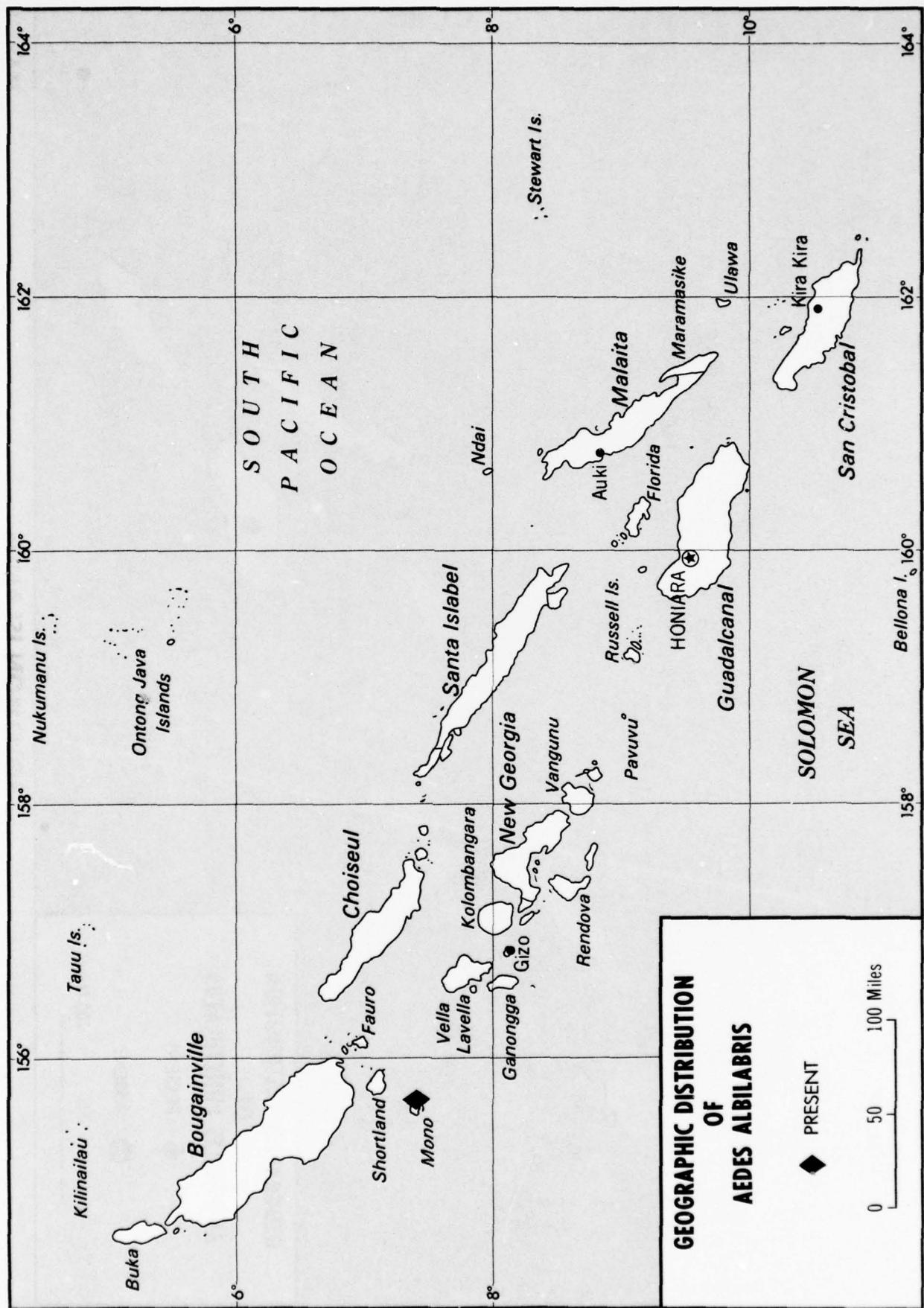
ROLE	HABITAT	BREEDING	BITING	REMARKS
<i>Culex halifaxi</i>	artificial containers and rock pools on coral cliffs of Stirling Island. (2058)			mouth brushes adapted for grasping. larvae are predatory on aquatic forms of other species. (2058)
<i>Culex hilli</i>				source: 2030.
<i>Culex sitiens</i>	numerous coral pockets in high cliffs of Stirling Island south coast. brackish and salt water. rarely found inland. (2058)			larvae to adult = app. 16 days. develops best in sea water 25% or over. (2058)
<i>Mansonia uniformis</i>	commonly breeds in fresh water swamps. (2147)		prefers to bite outdoors. (2147)	probably rarely comes in contact with spraying. (2147) additional source: 2030.
<i>Tripteroides quasiornata</i>				source: 2030.
<i>Tripteroides solomonis</i>	coconut shells, occasional coral pockets with high concentration dissolved organic tannins. (2058)			



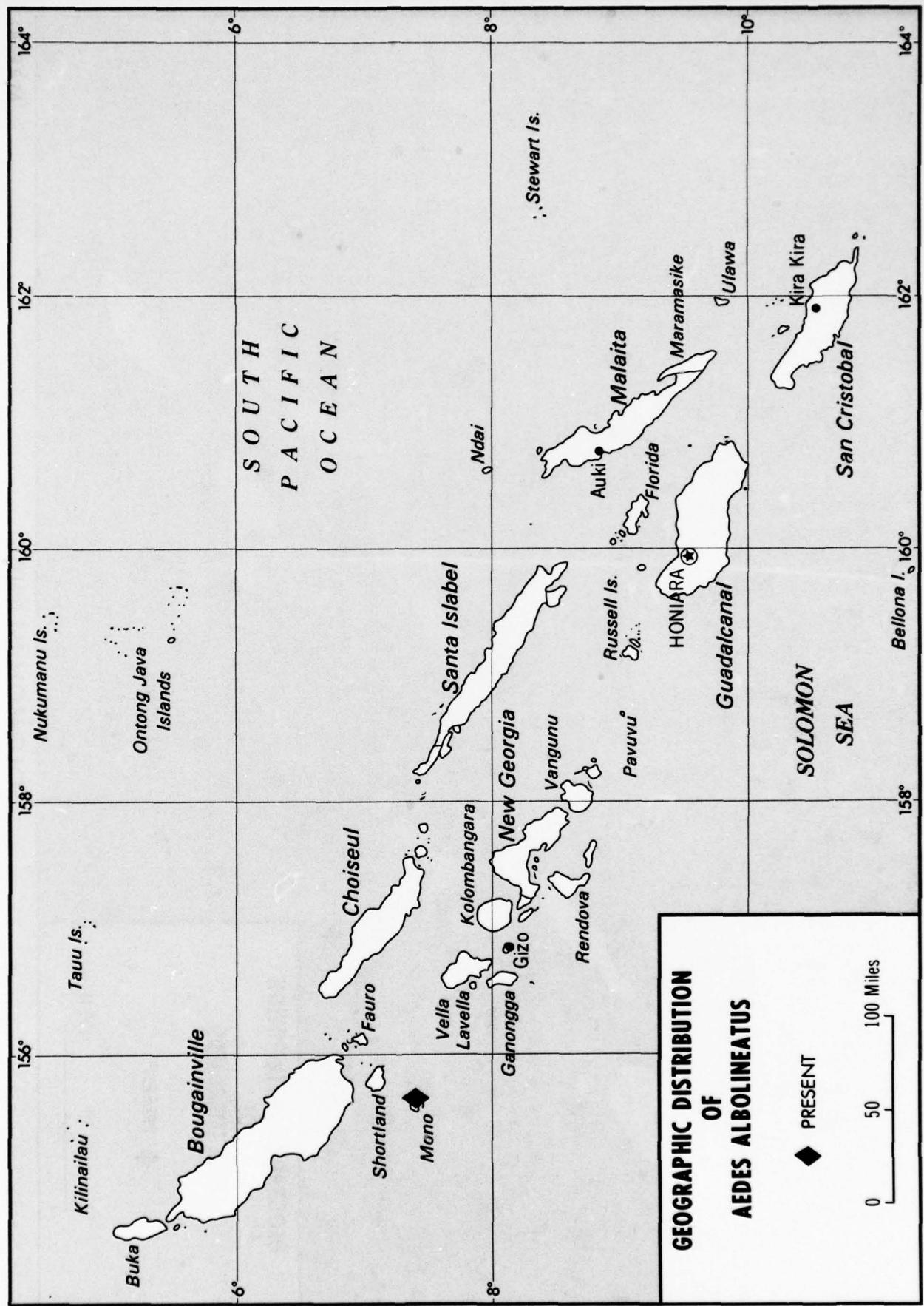




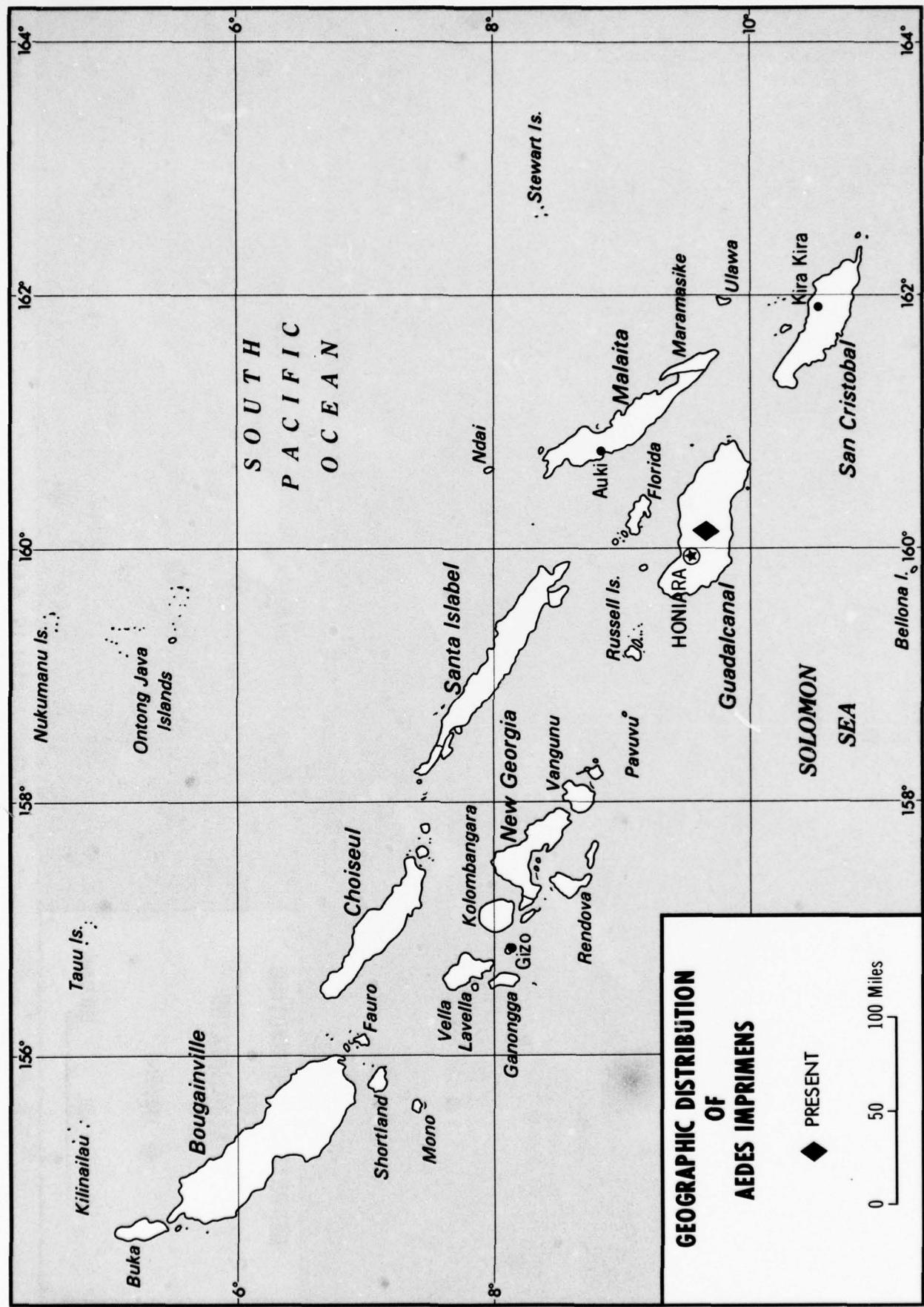
MAP 78



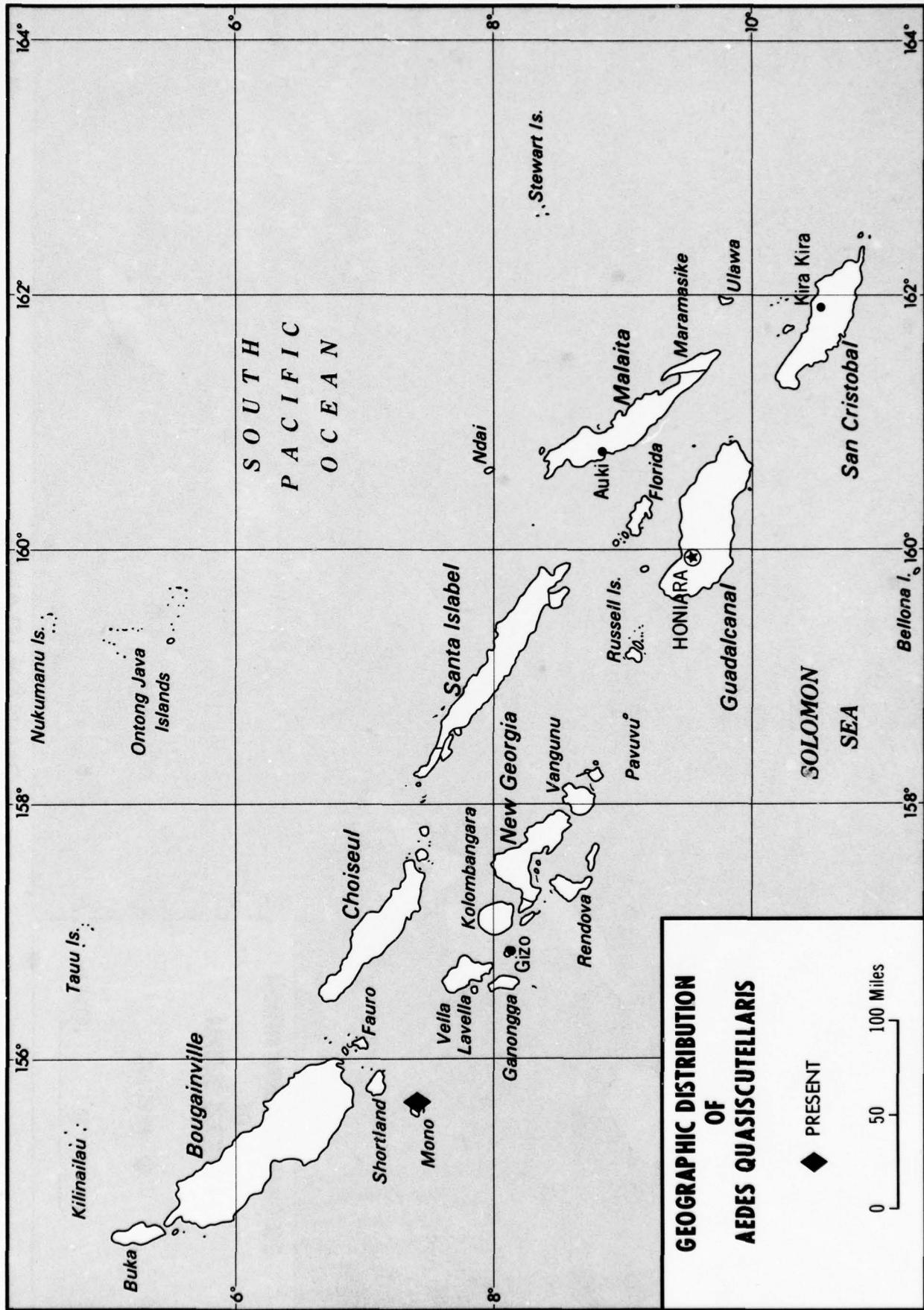
MAP 79
SOLOMON ISLANDS

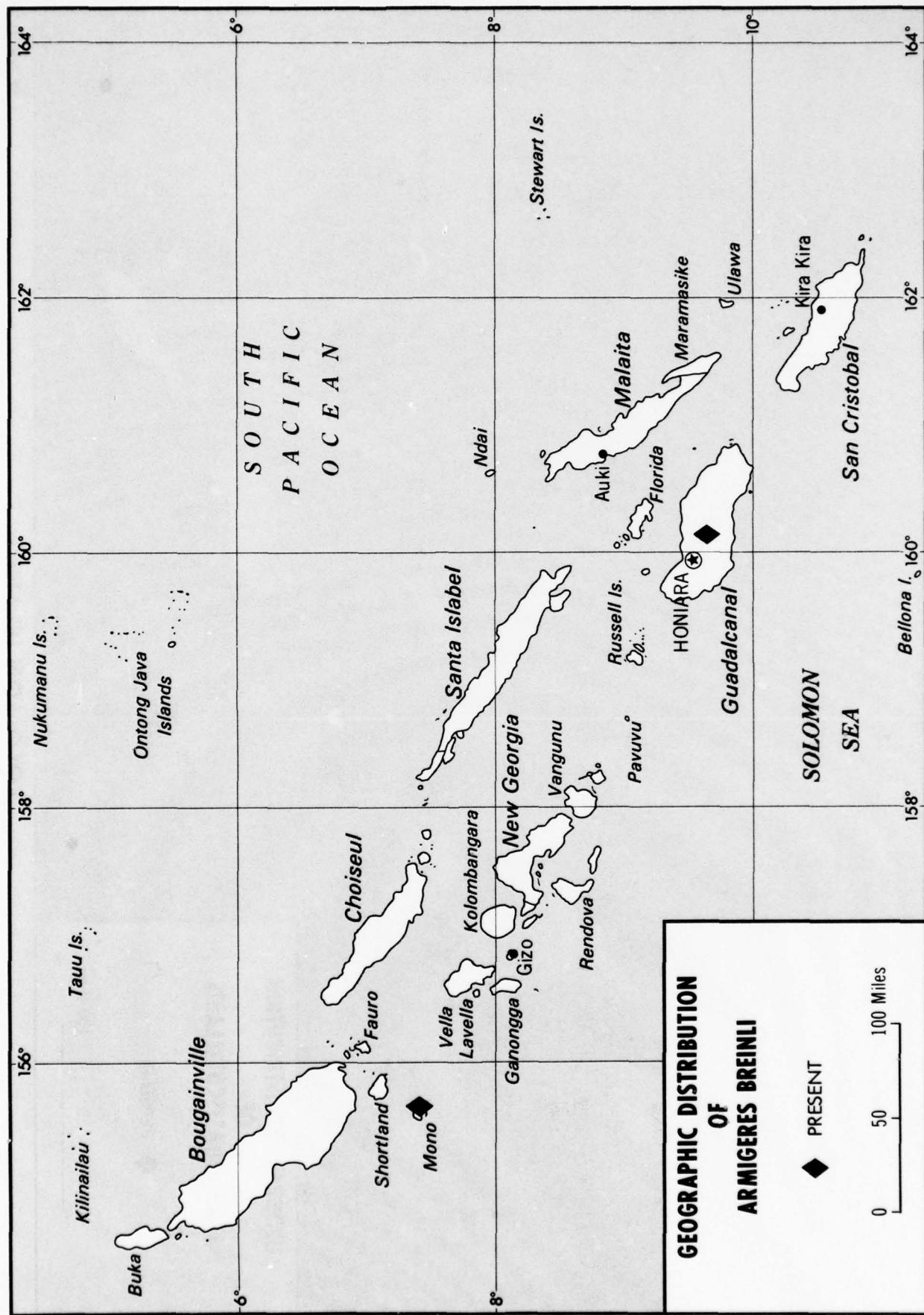


SOLOMON ISLANDS

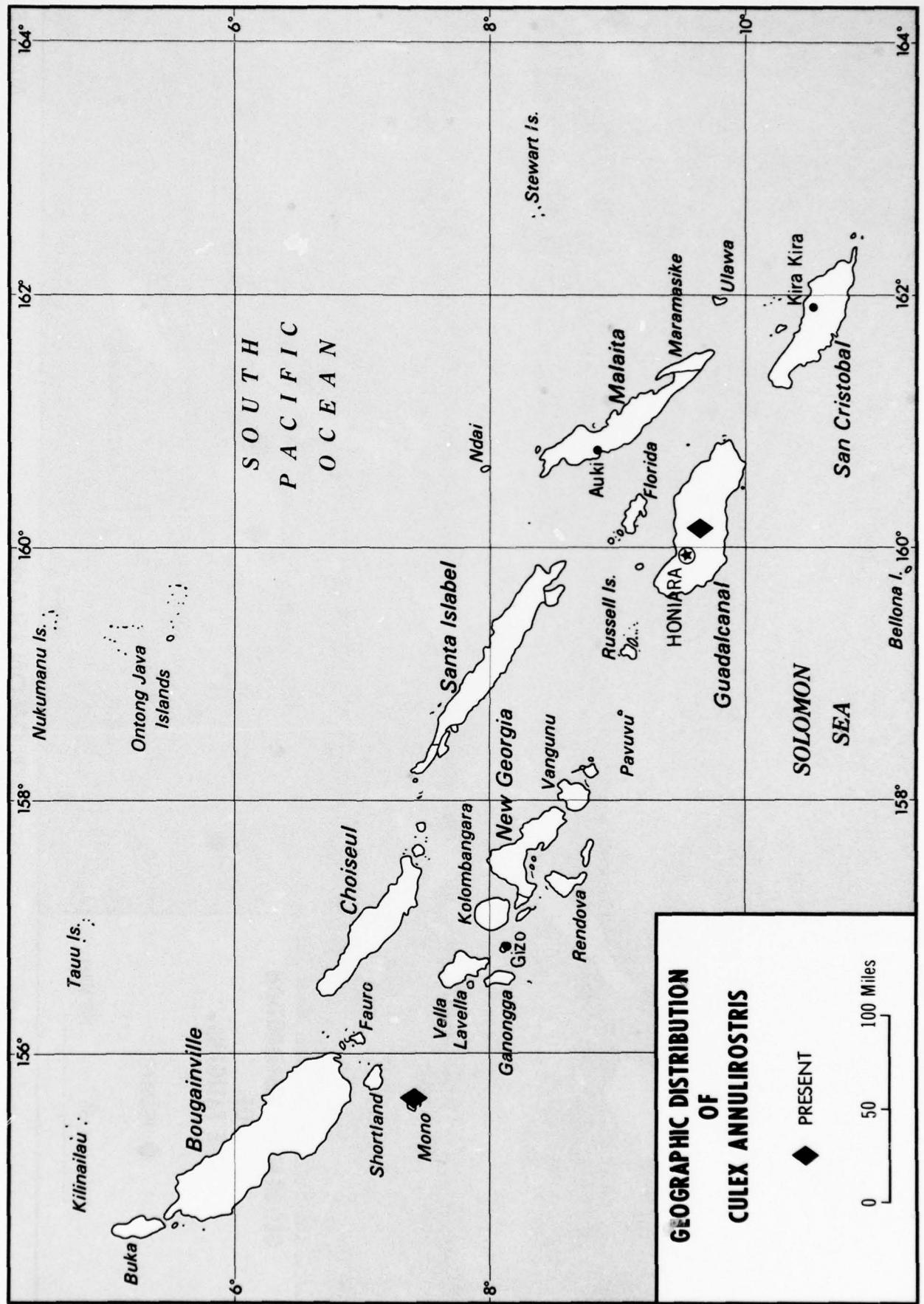


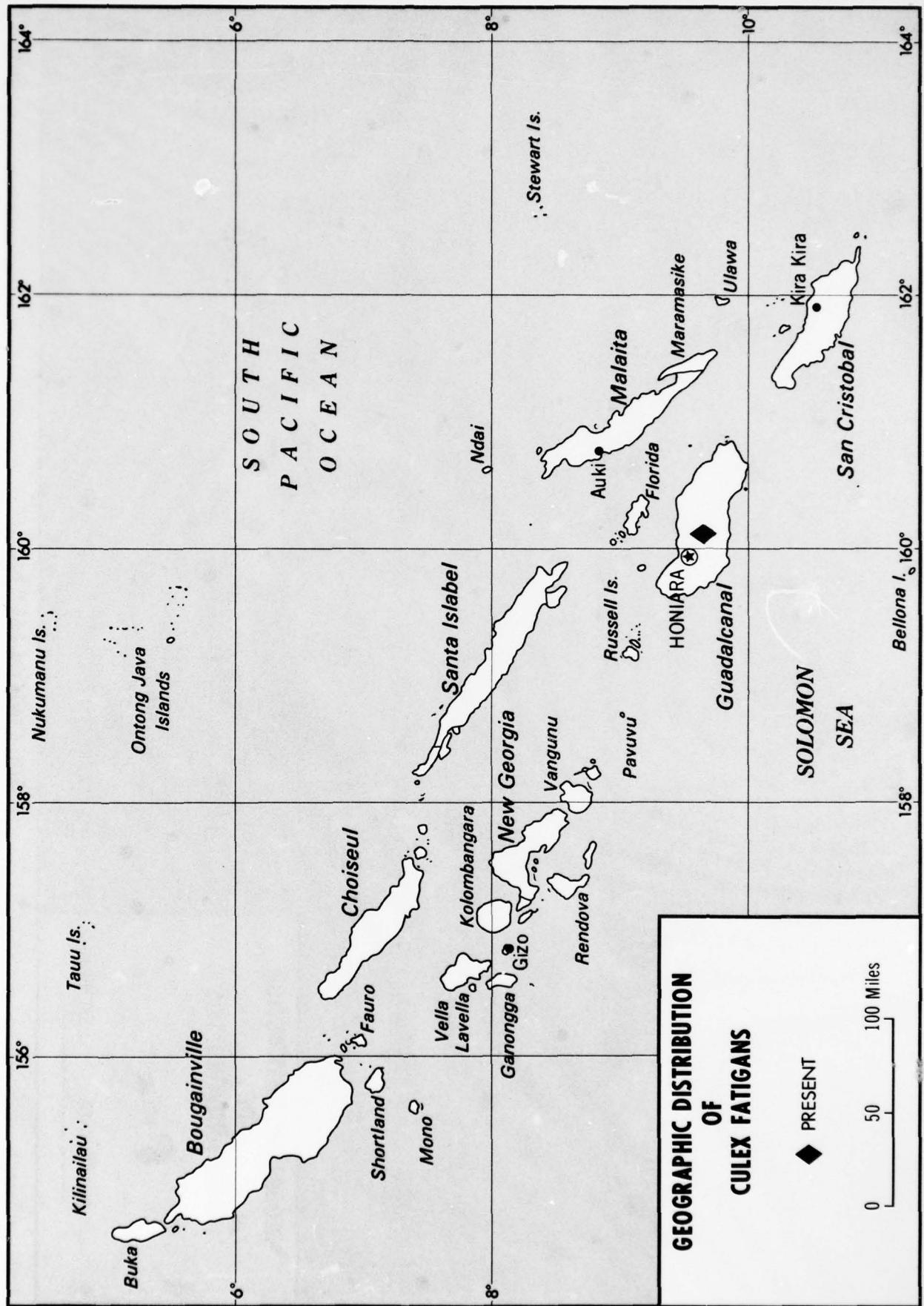
SOLOMON ISLANDS

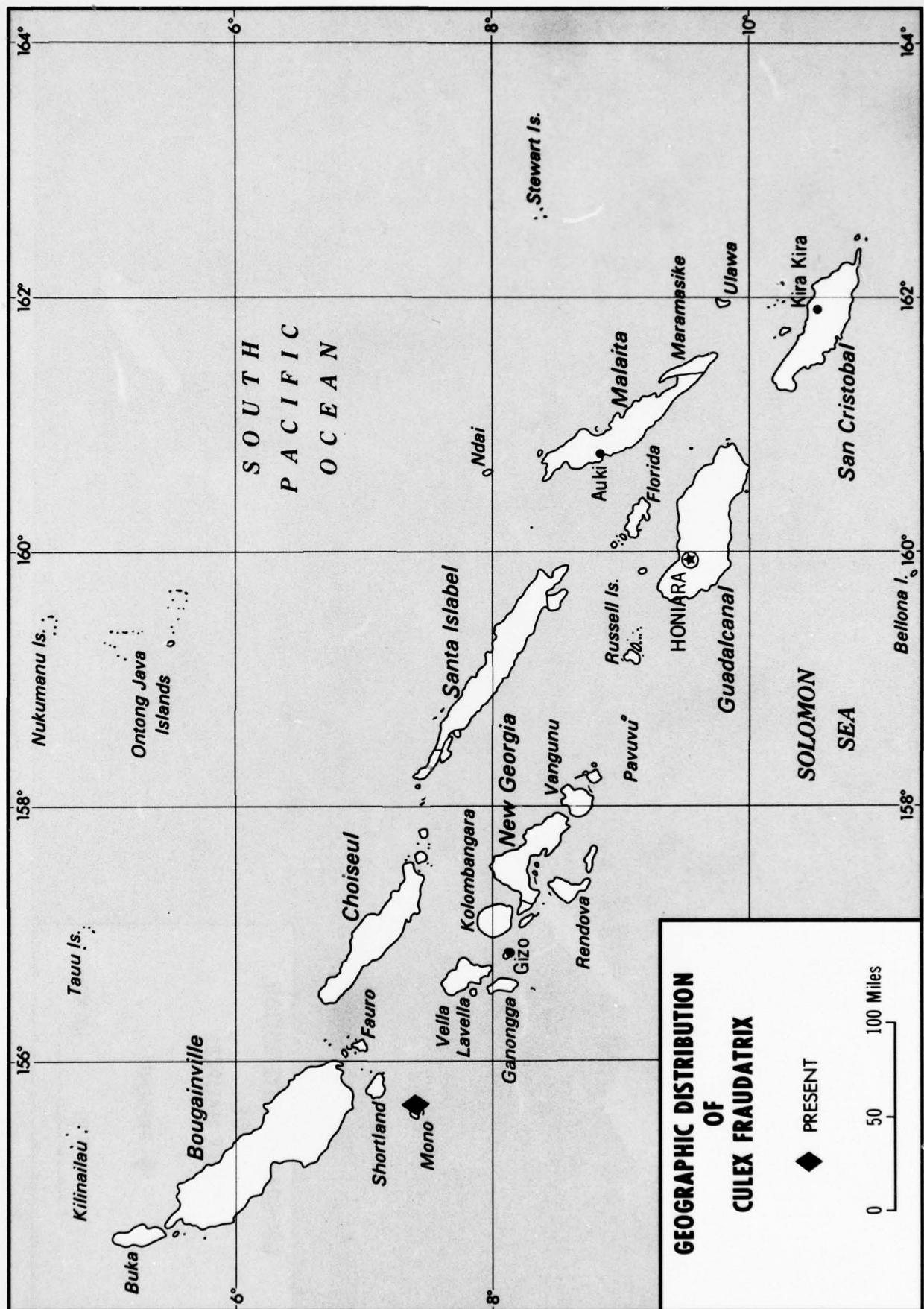




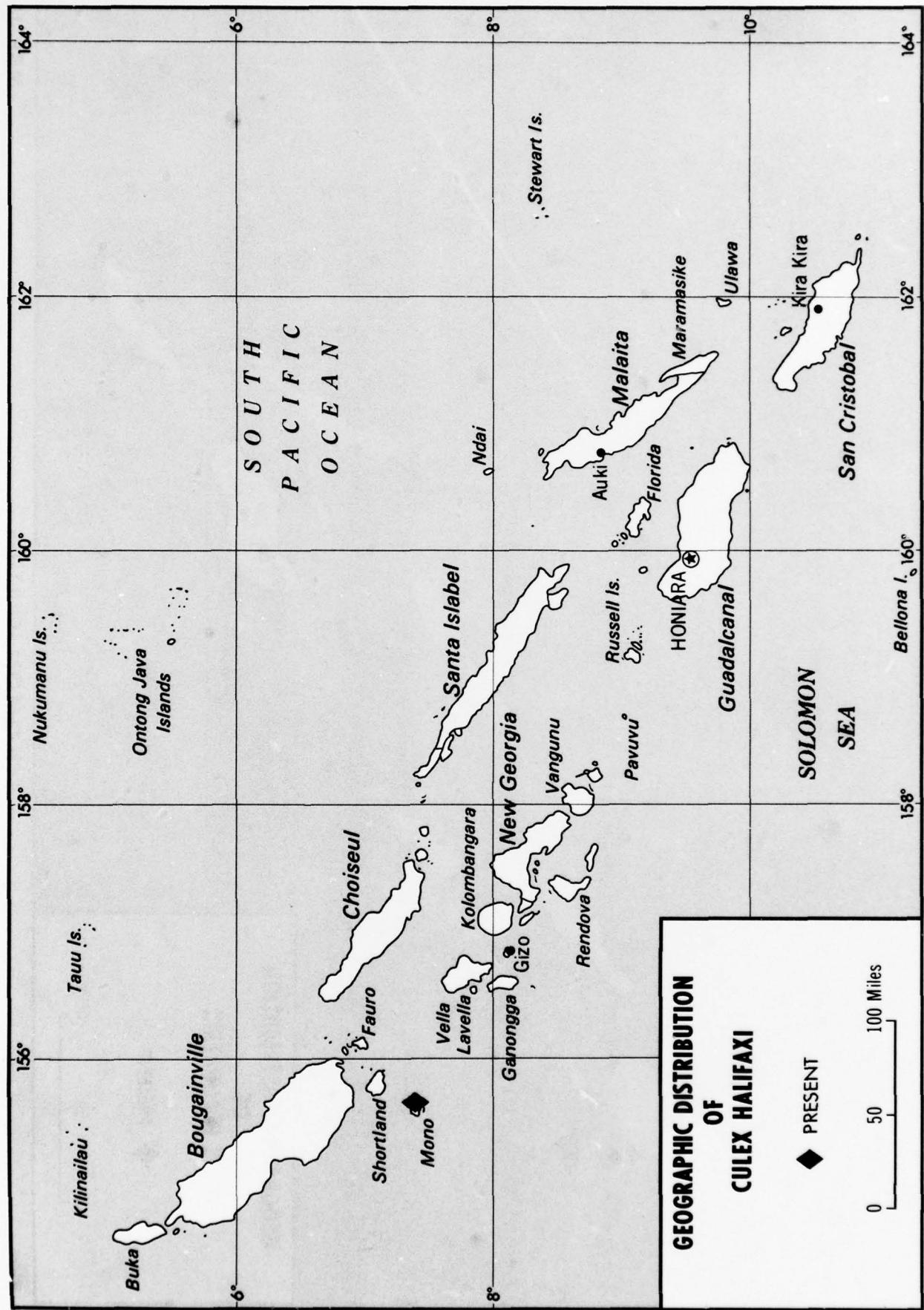
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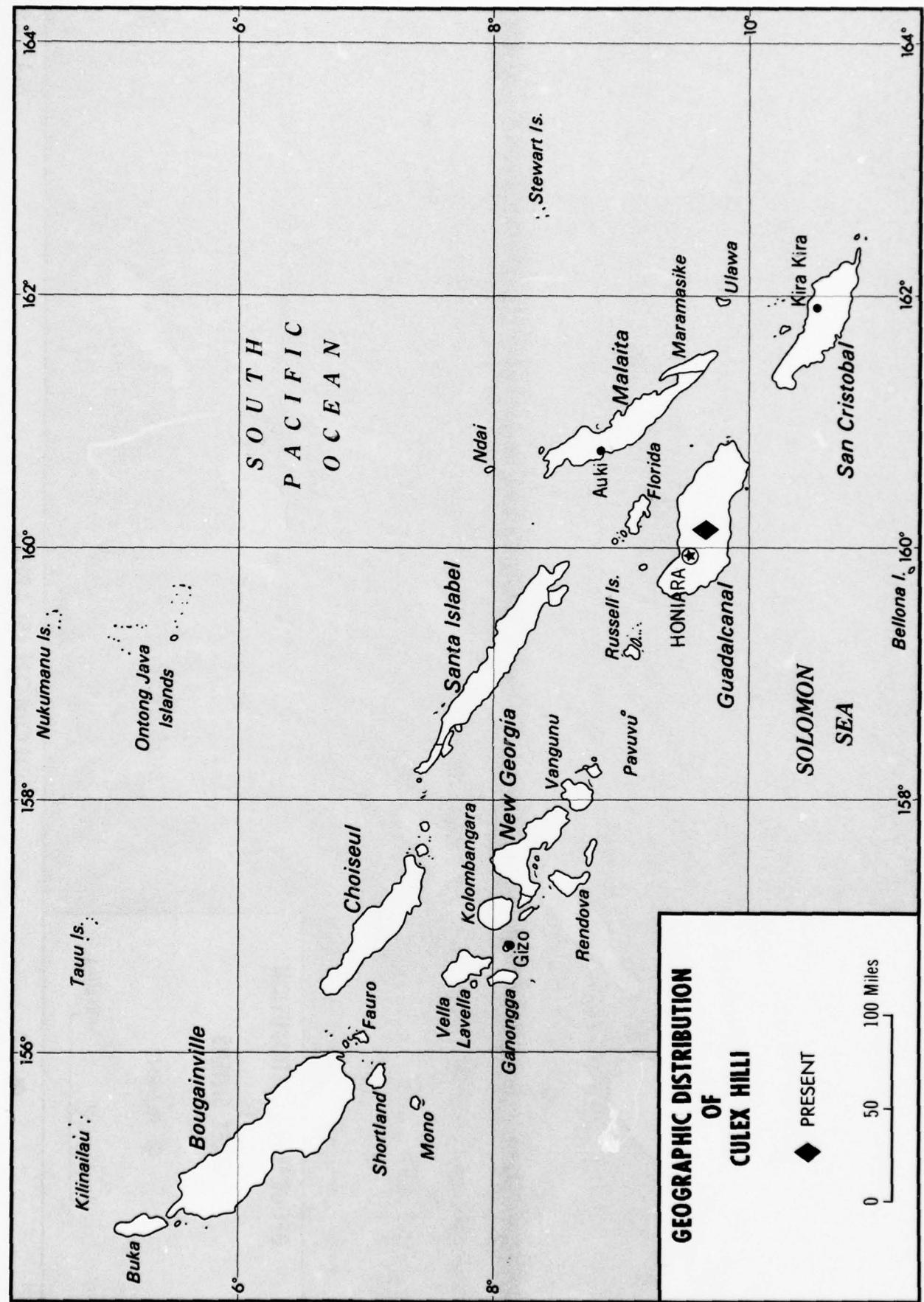






SOLOMON ISLANDS

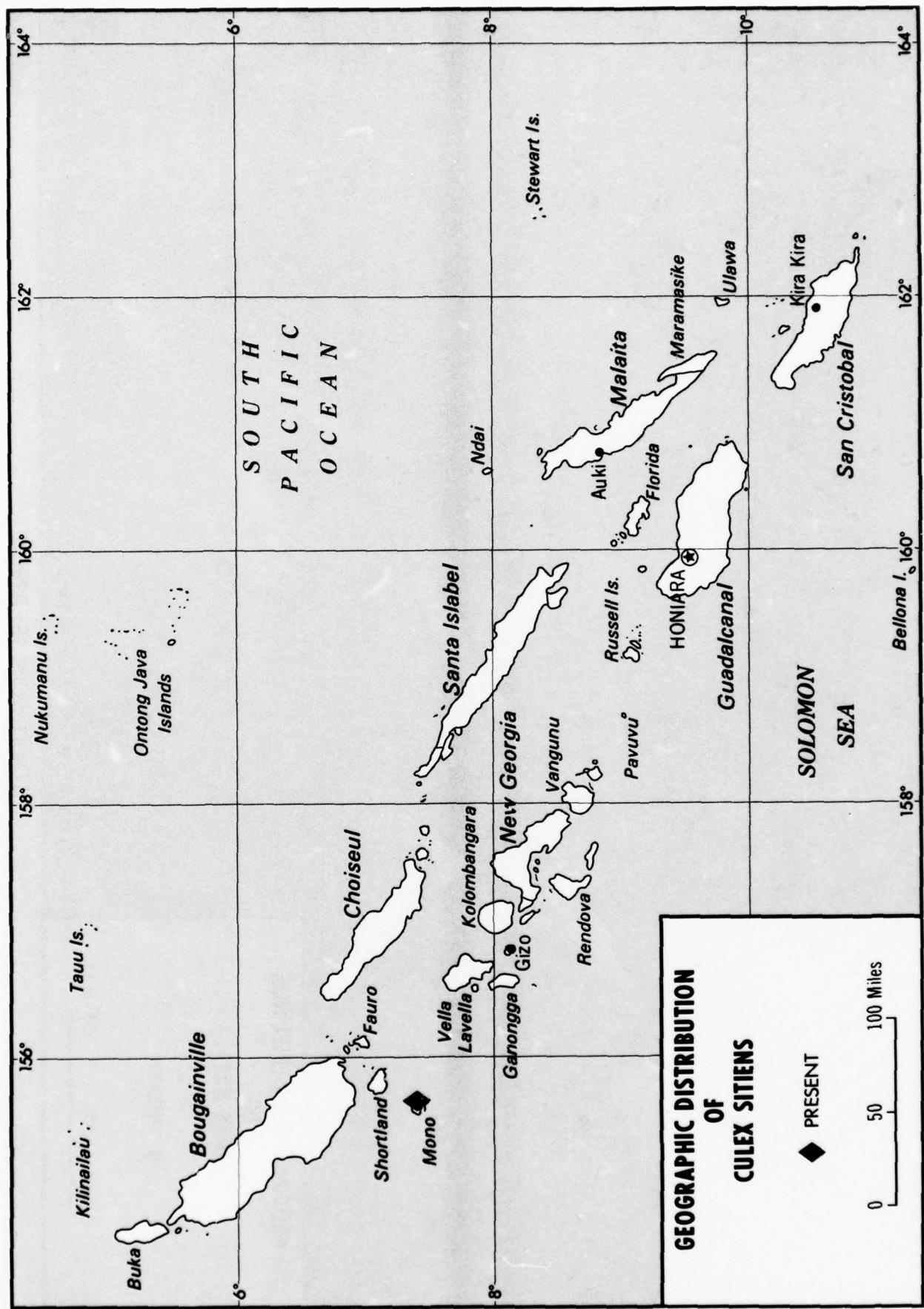


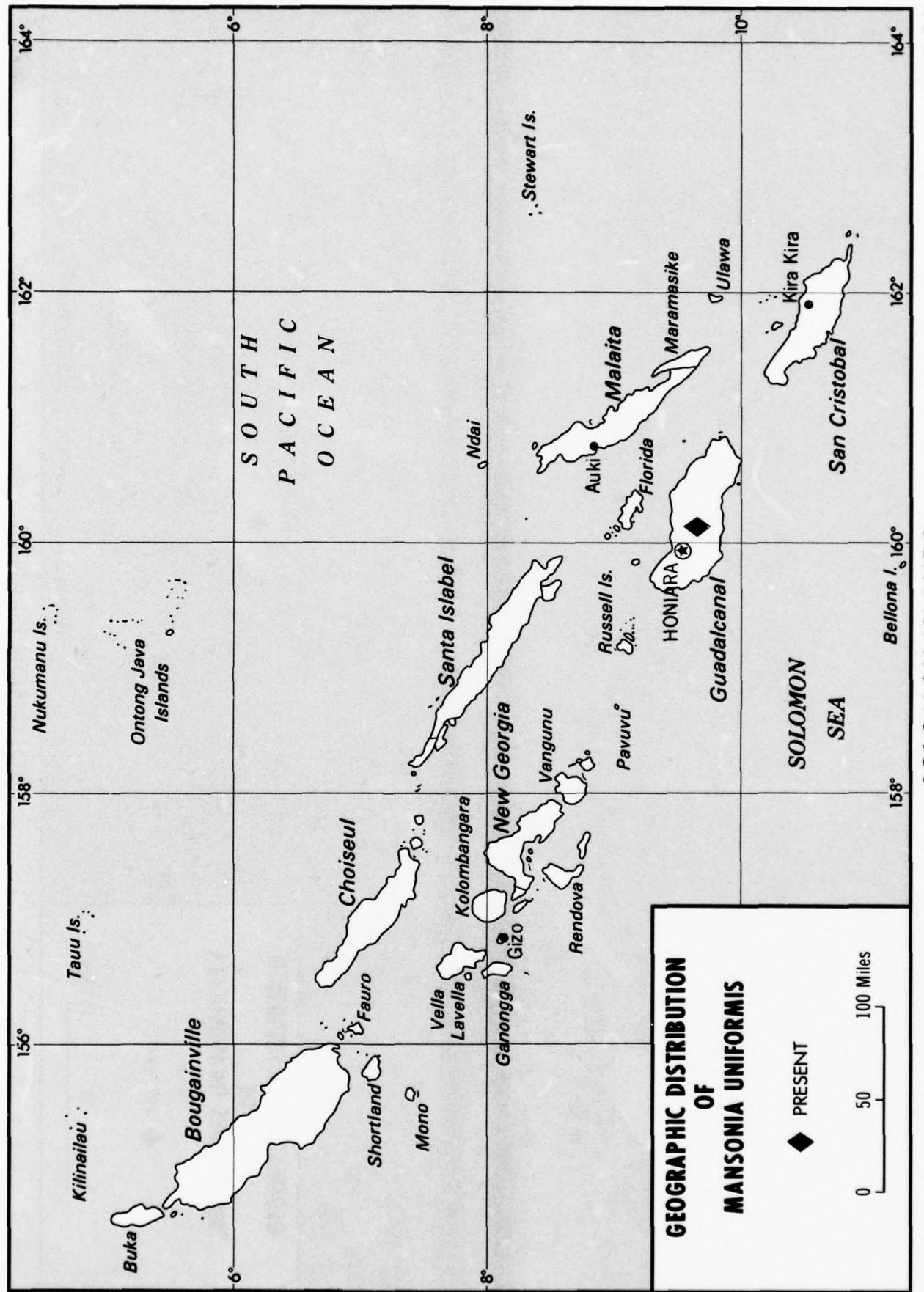


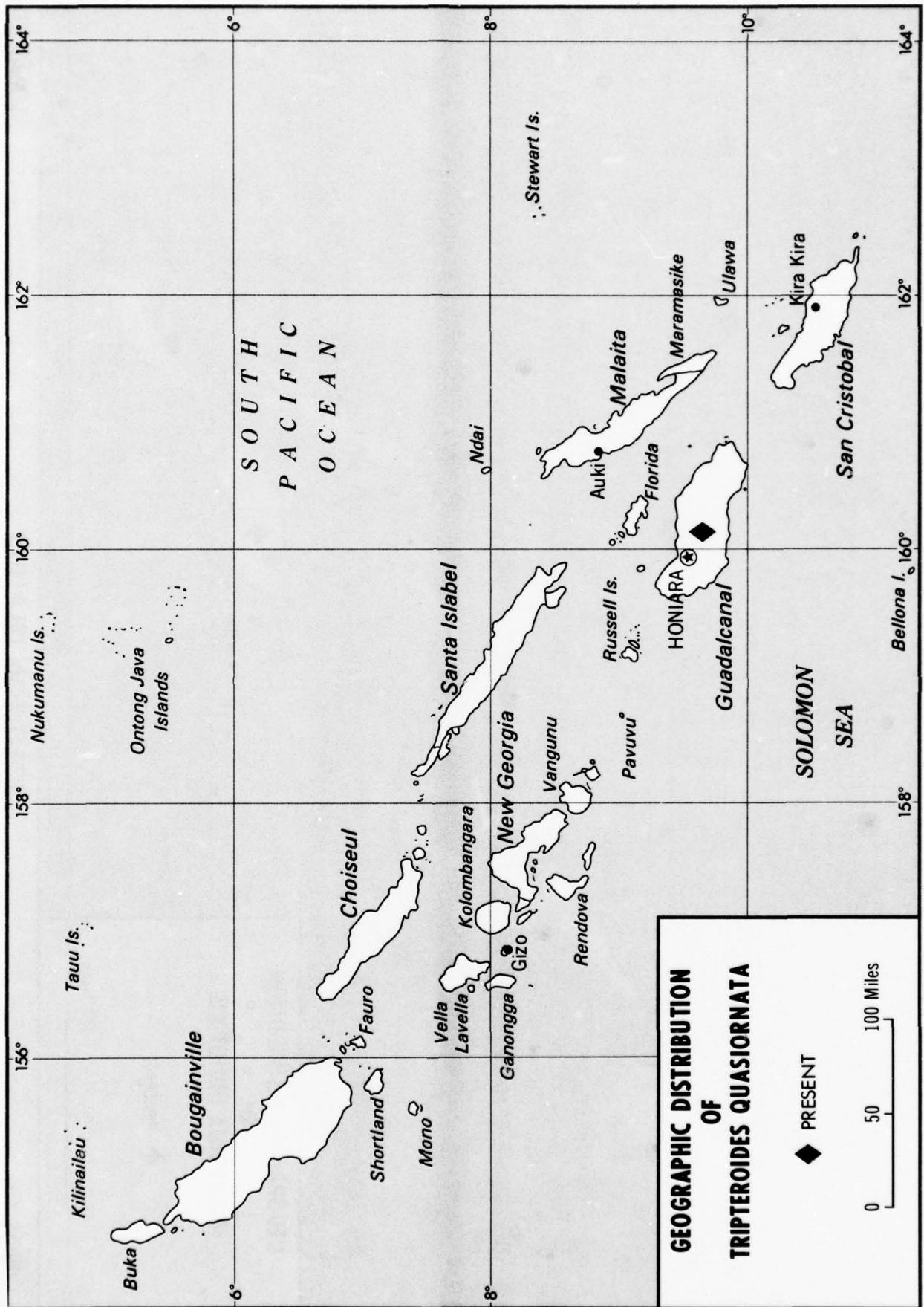
**GEOGRAPHIC DISTRIBUTION
OF
CULEX HILLI**

◆ PRESENT

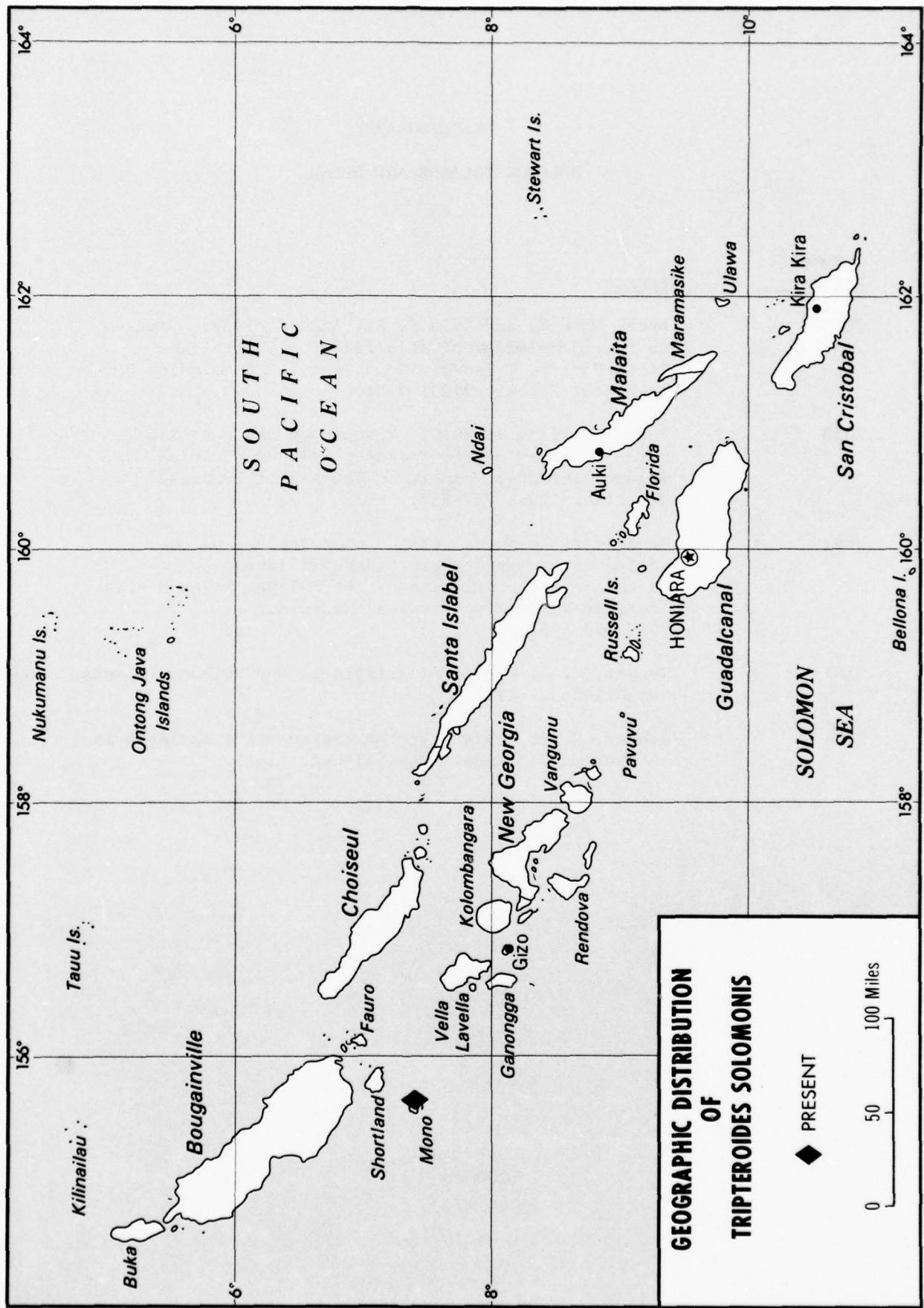
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SOLOMON ISLANDS



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SOLOMON ISLANDS AND HUMAN

<u>Document Number</u>	<u>Source</u>
2030	Byrd, Elon E. and Lyle S. St. Amant. 1959. Studies on the epidemiology of filariasis on Central and South Pacific Islands. South Pacific Commission Technical Paper. #125: 1-96.
2058	Perry, William J. 1949. Mosquitoes and mosquito borne diseases of the Treasury Islands (British Solomon Islands). American Journal of Tropical Medicine. 29: 747-758.
2091	Schlosser, Ralph J. 1945. Observations on the incidence of <u>Wuchereria bancrofti</u> larvae in the native population of the Solomon Islands area. American Journal of Tropical Medicine. 25: 493-495.
2147	Webber, R. H. 1974. Filariasis in the Solomon Islands. Unpublished. 1-12.
2161	Webber, R. H. 1974. Vector control of filariasis in the Solomon Islands. Unpublished. 1-11.

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SOLOMON ISLANDS AND MOSQUITO

<u>Document Number</u>	<u>Source</u>
2030	Byrd, Elon E. and Lyle S. St. Amant. 1959. Studies on the epidemiology of filariasis on Central and South Pacific islands. South Pacific Commission Technical Paper. #125: 1-96.
2058	Perry, William J. 1949. Mosquitoes and mosquito borne diseases of the Treasury Islands (British Solomon Islands). American Journal of Tropical Medicine. 29: 747-758.
2103	DeLand, C. M. 1951. Filariasis in Melanesia. Trans. Roy. Soc. Trop. med/hyg. 44: 610.
2109	Perry, William J. 1950. Principal larval and adult habitats of <u>Anopheles farauti</u> lav. in the British Solomon Islands. Mosquito News. 10 (3): 117-126.
2147	Webber, R. H. 1974. Filariasis in the Solomon Islands. Unpublished. 1-12.
2161	Webber, R. H. 1974. Vector control of filariasis in the Solomon Islands. Unpublished. 1-11.

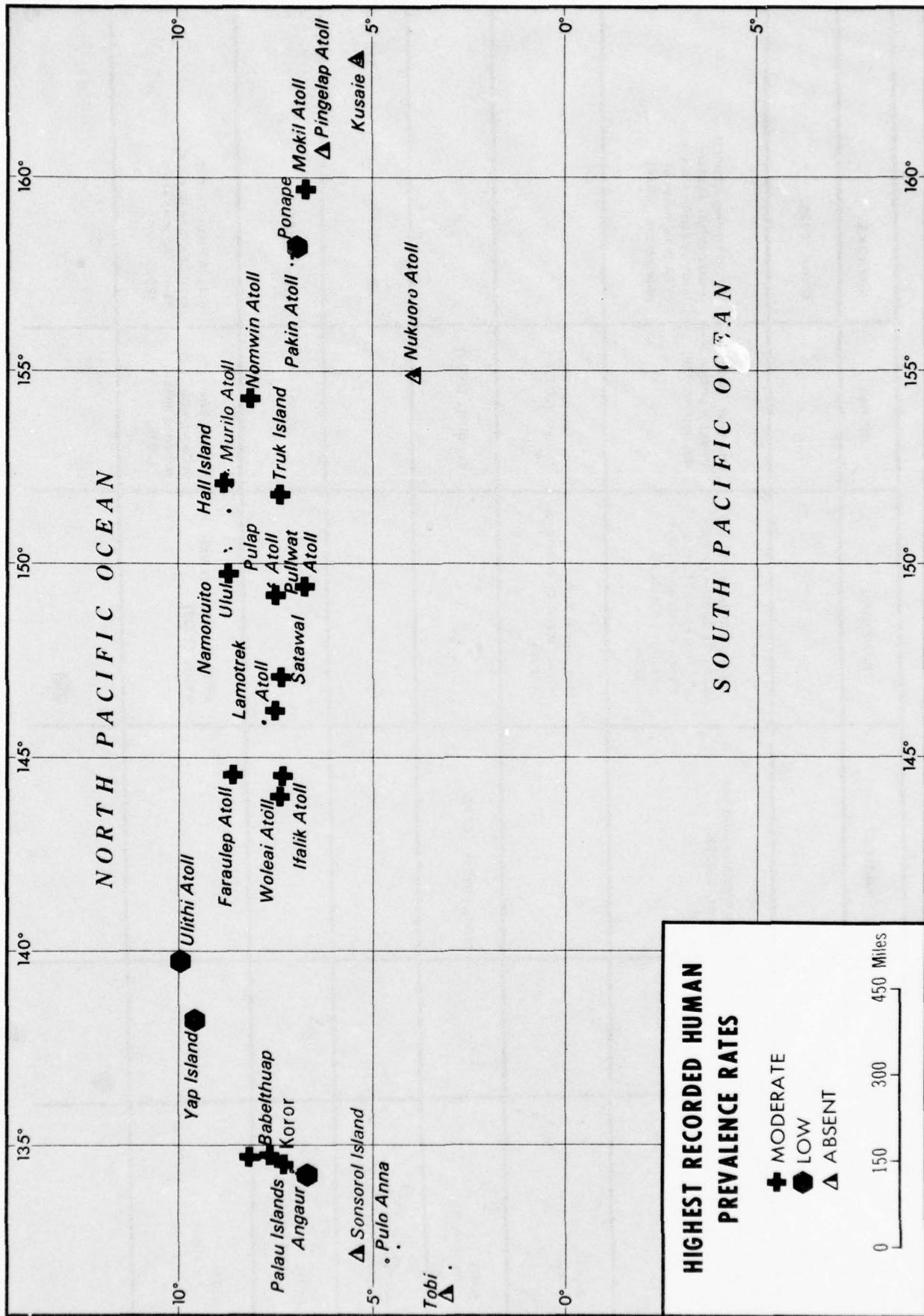
P. Caroline Islands

1. Human Data

Of the information in the Disease Information System, the last survey of the Caroline Islands was taken in 1952. There is not indication of any mosquito control or treatment measures being undertaken. The geographic distribution of the prevalence rates can be found in Map 93.

2. Mosquito Data

Information on the role and the bionomics of the various mosquitoes in the Caroline Islands can be found in Table 24. Information on the geographic distribution of the various mosquito species is presented in Maps 94 to 105.



CAROLINE ISLANDS

Table 24

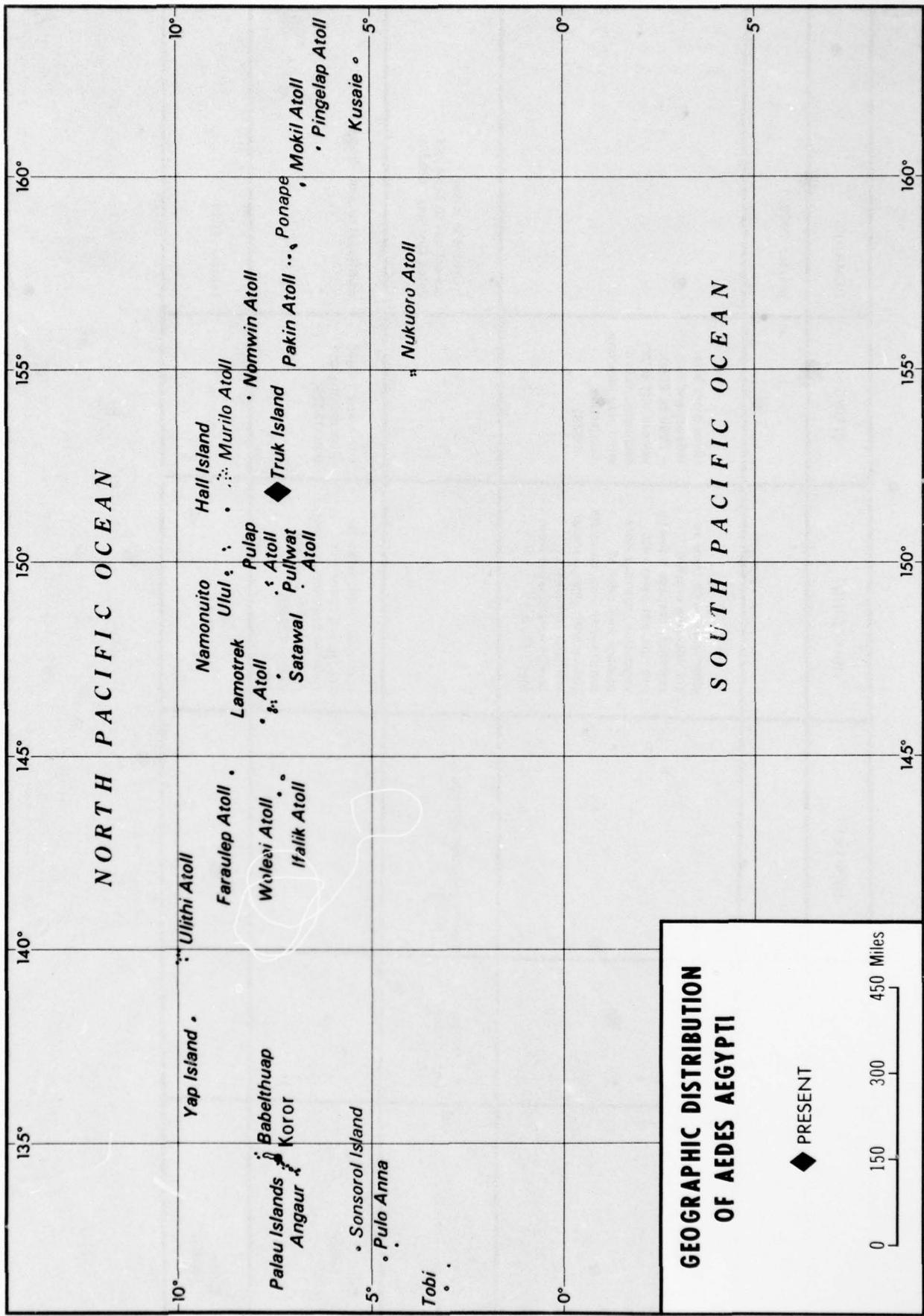
CAROLINE ISLANDS — MOSQUITO DATA

	ROLE	HABITAT	BREEDING	BITING	REMARKS
<i>Aedes aegypti</i>					source: 2039.
<i>Aedes hensilli</i>	deep vegetation but not houses. (2039)	coconut shells, palm trunk step cuts, banana stumps and taro axis at Koror. pitcher plants on red clay hillsides at Babedob. (2039)	shy biter, early morning or cloudy daytime. (2039)	indoor feeding attempts unsuccessful. outdoor feeds on carrier = death in 24 to 48 hours of observation. (2039)	
<i>Aedes kochi</i>		taro axis at Koror. pitcher plants on Babedob. (2039)	shy, seldom in houses. (2039)		
<i>Aedes moenensis</i>	grassy ditches. (2039)		day biter. (2039)	absent. (2133)	
<i>Aedes pseudoscutellaris</i>				source: 2039.	
<i>Aedes scutoscriptus</i>				shy day biter. indoors with subdued light. (2039)	only in Palau District. most common larvae at Koror, none at Truk. (2039)
<i>Aedes zonatus</i>		artificial containers clear water. (2039)			
					204

Table 24 cont.

CAROLINE ISLANDS — MOSQUITO DATA

	ROLE	HABITAT	BREEDING	BITING	REMARKS
<i>Aedes zonatipes</i>				source: 2039.	
<i>Culex annulirostris</i>		clear water with some to considerable organic material. seepage holes by swamps, pot holes with vegetation, coconut fibre sewage pits, edge of sulfurous swamp, concrete cistern with algae, various artificial containers, breeds well isolated from man. (2039)	fierce night biter indoors and out ~ 2000 to 2200. seldom bite after midnight, rain or wind may interfere with biting. (2039)		
<i>Culex carolinensis</i>	no medical importance. (2039)	rarely in house collections. (2039)		frequent in larval collections in Truk and Palau Districts. (2039)	
<i>Culex fatigans</i>			man-made sites, artificial containers, sump holes, coconut fibre soaking pits. preference for polluted water. (2039)	commonest night biter indoors and out. (2039)	additional source: 2113.
<i>Culex pullus</i>					source: 2039



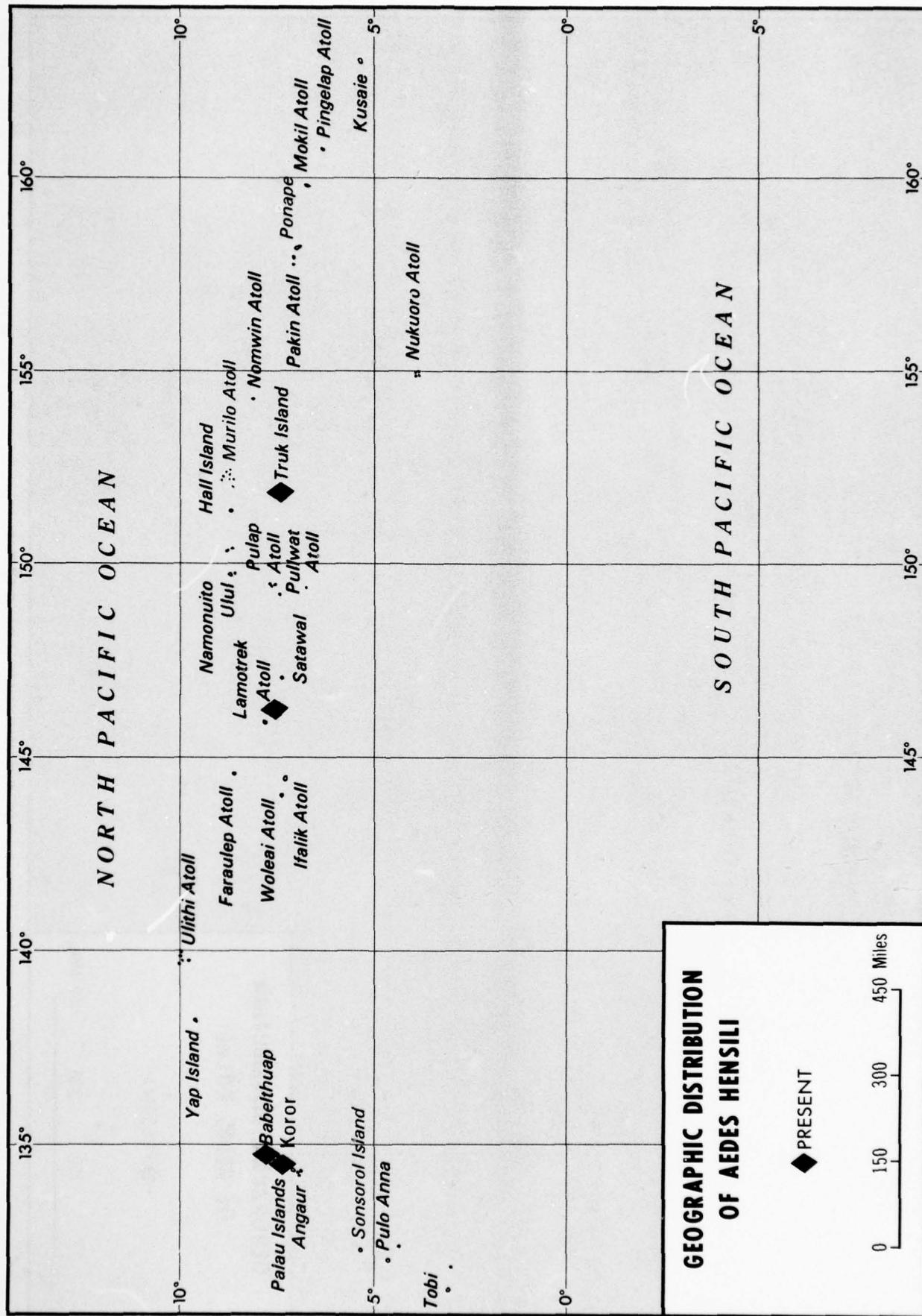
**GEOGRAPHIC DISTRIBUTION
OF AEDES AEGYPTI**

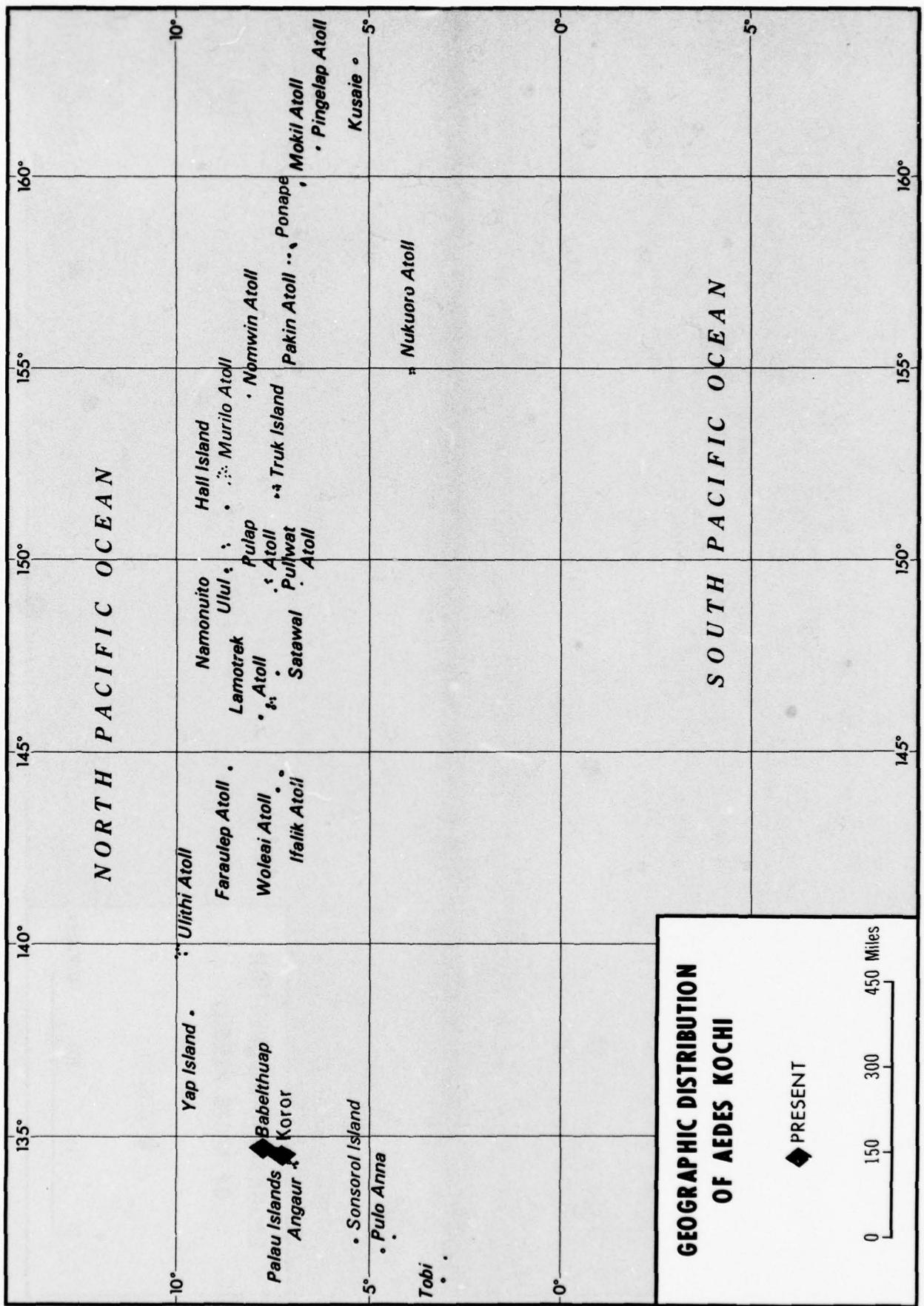
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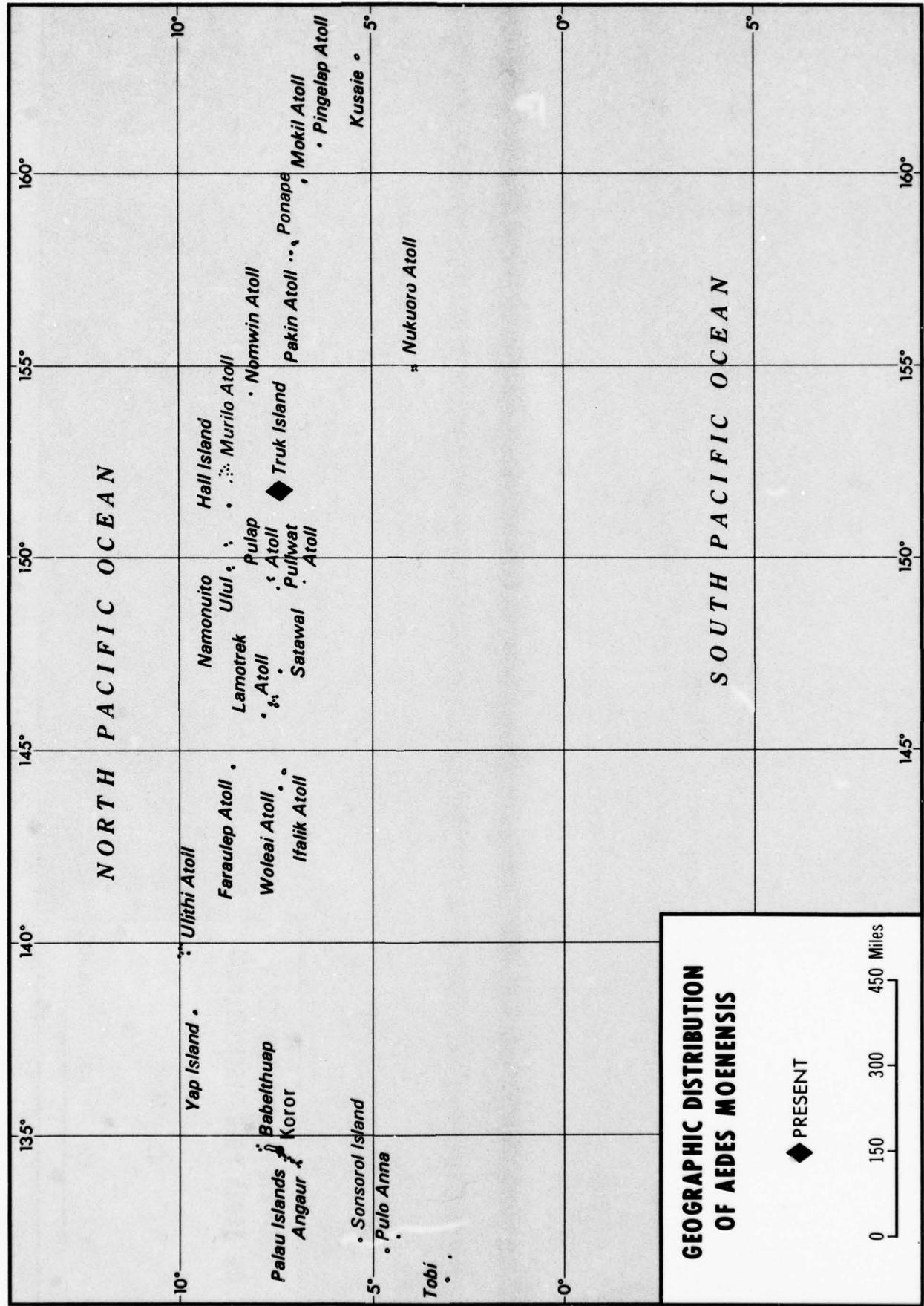
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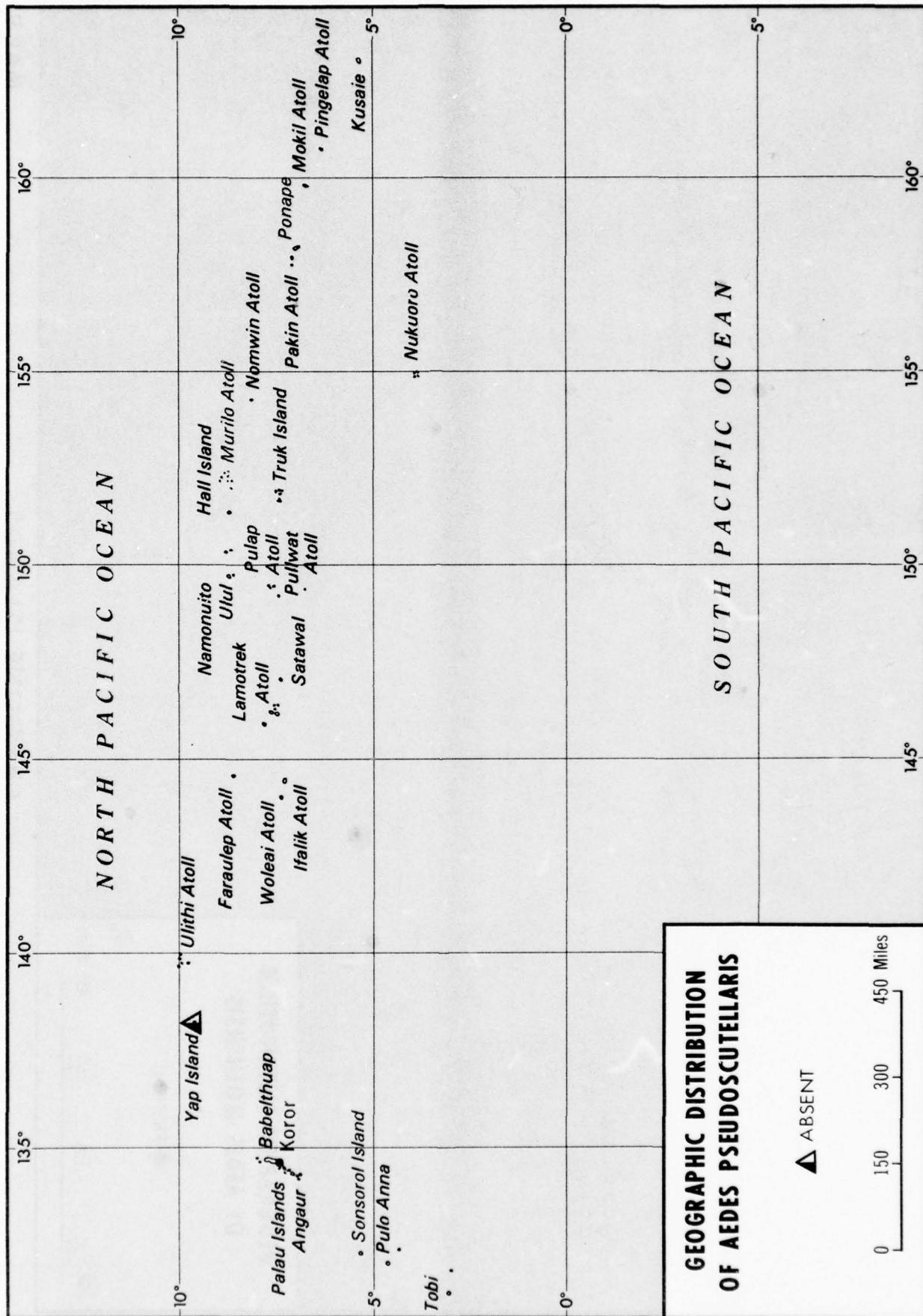
CAROLINE ISLANDS

MAP 94





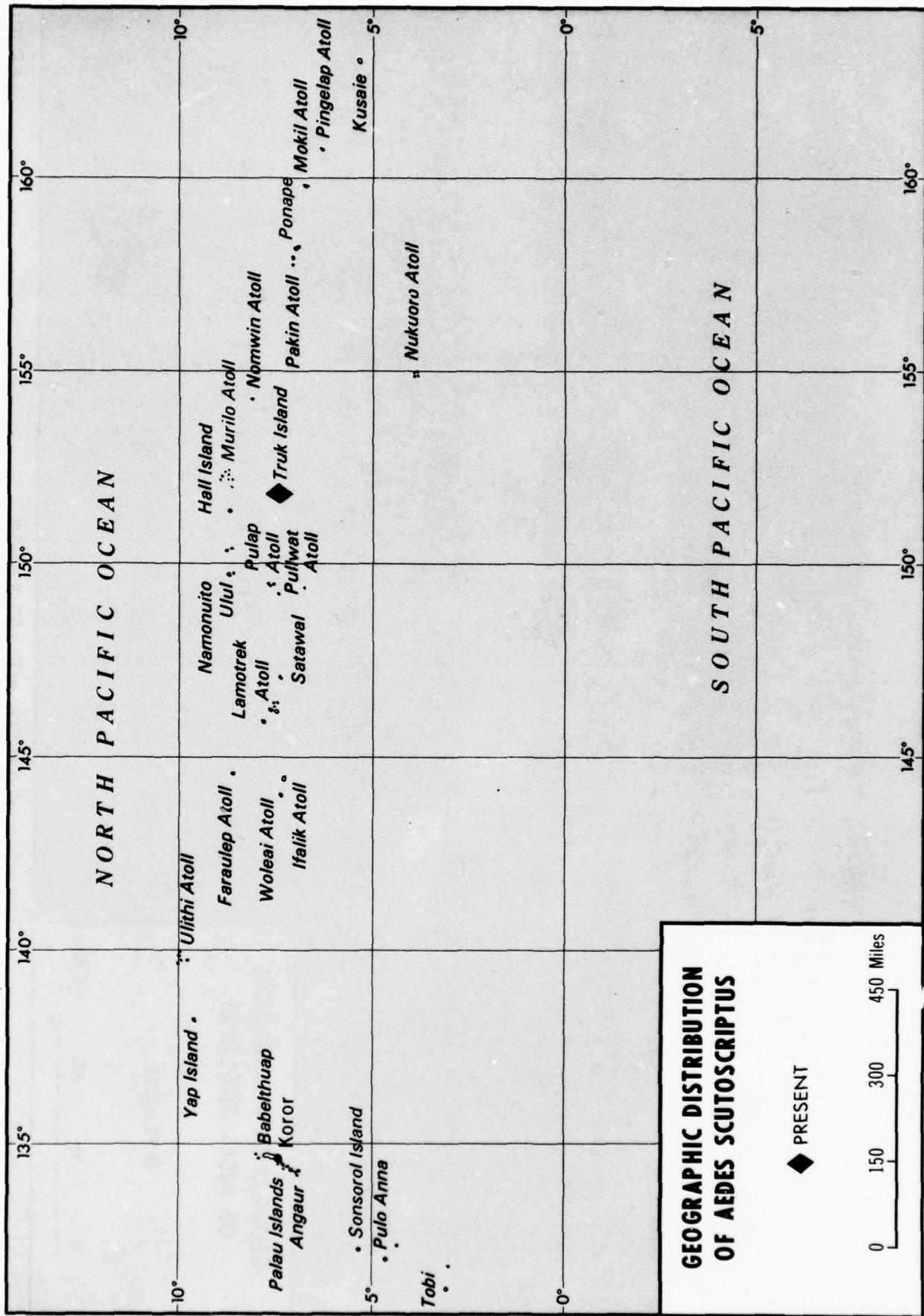


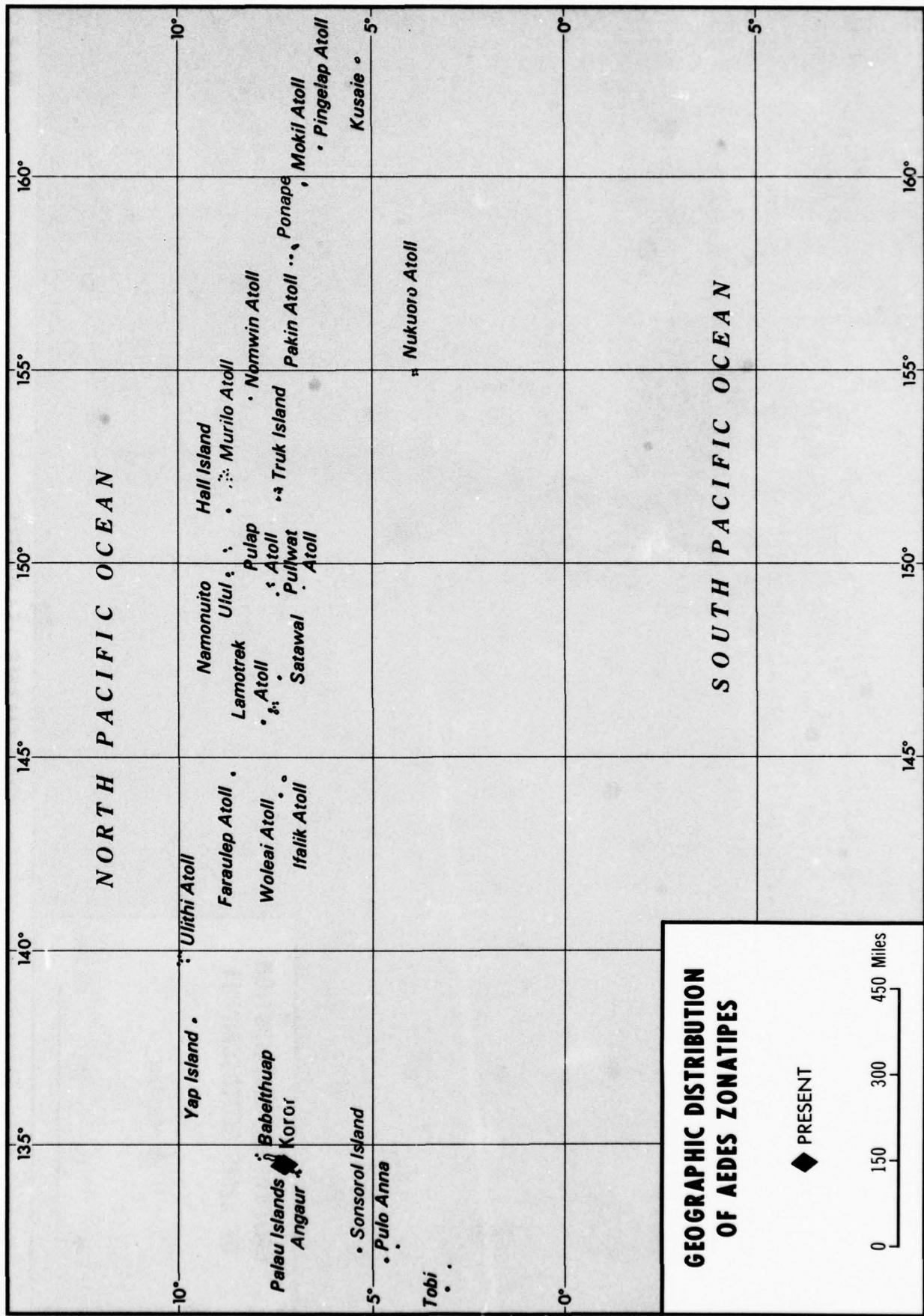


**GEOGRAPHIC DISTRIBUTION
OF *AEDES PSEUDOSCUTELLARIS***

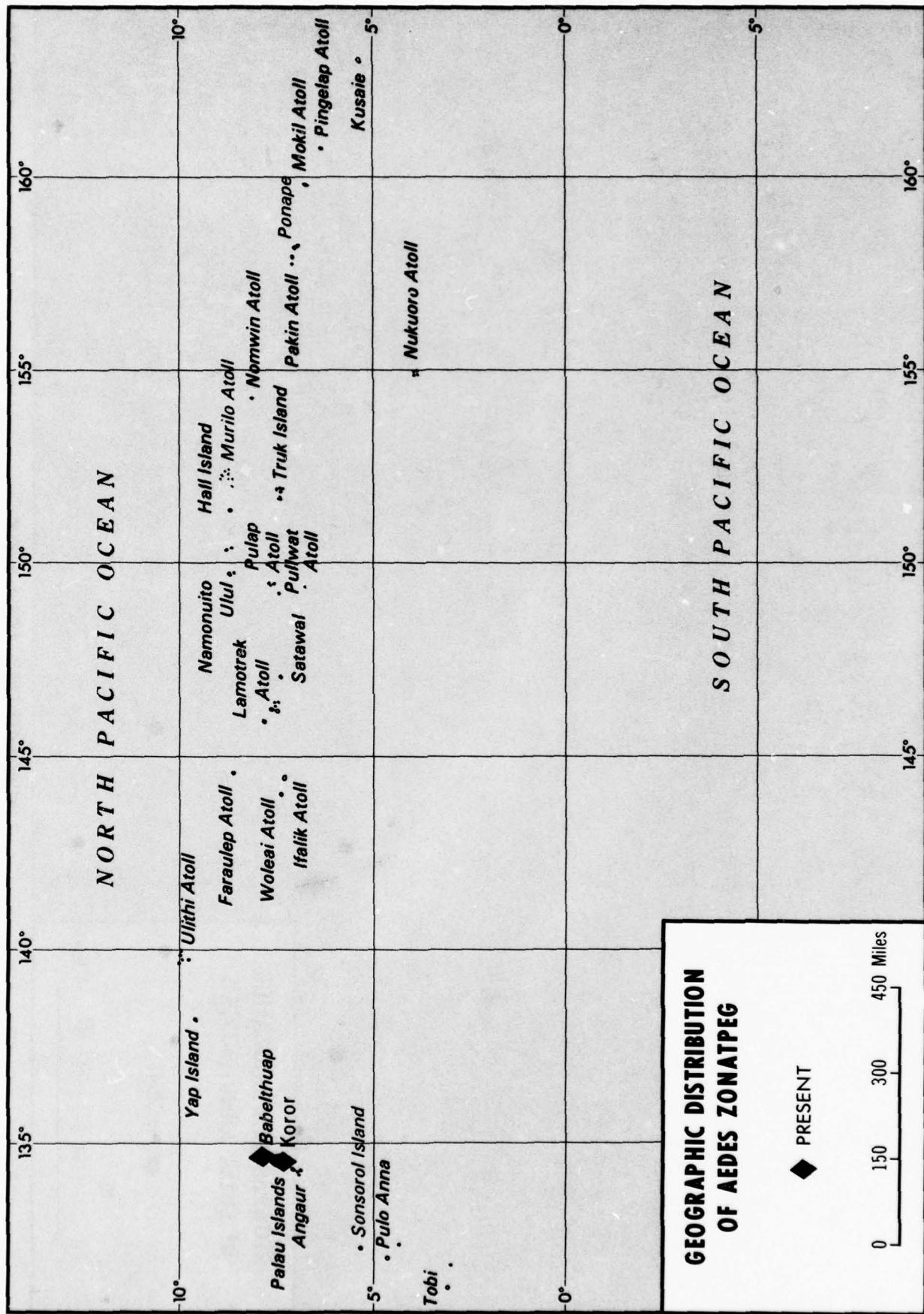
△ ABSENT

0 150 300 450 Miles

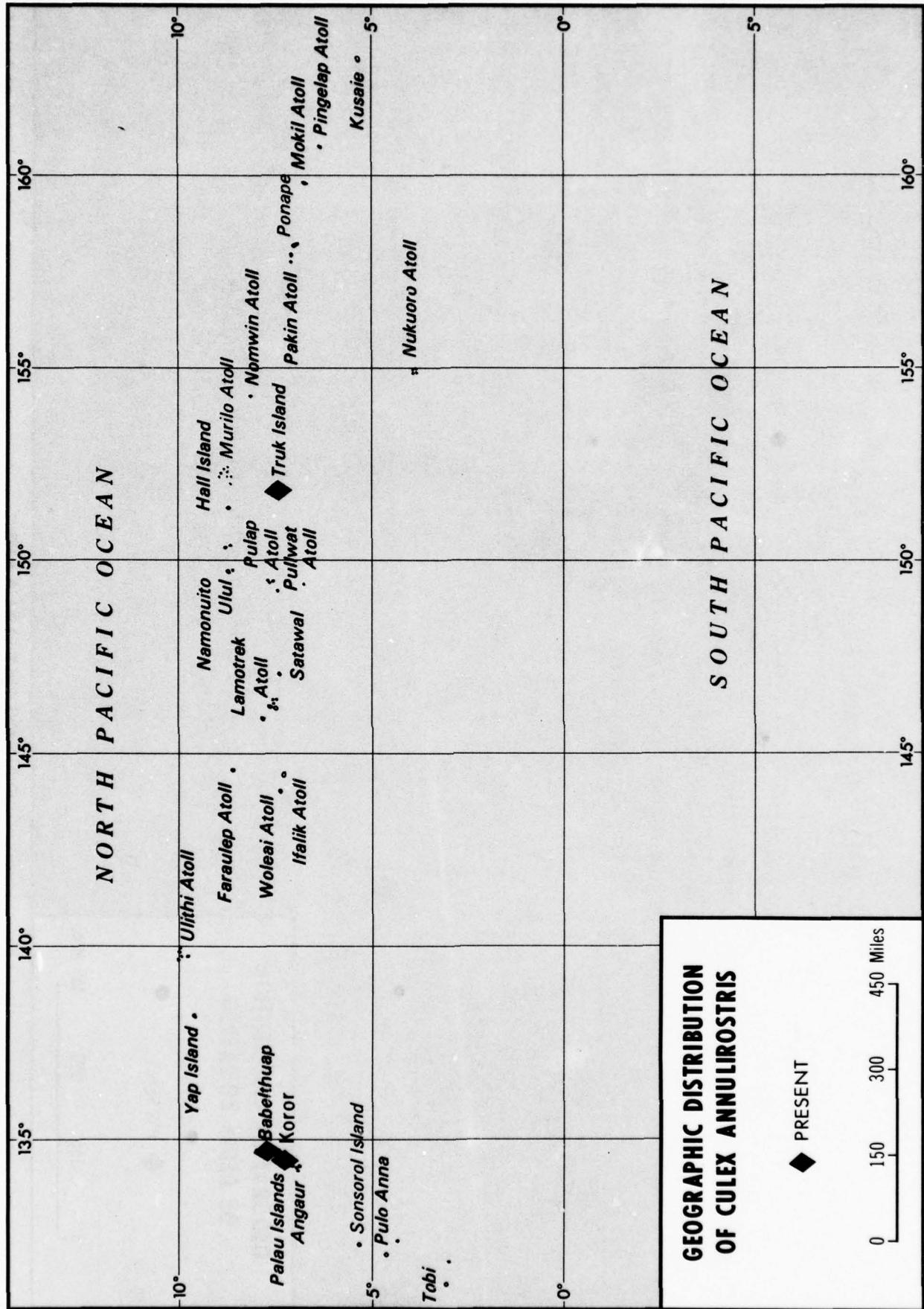




CAROLINE ISLANDS



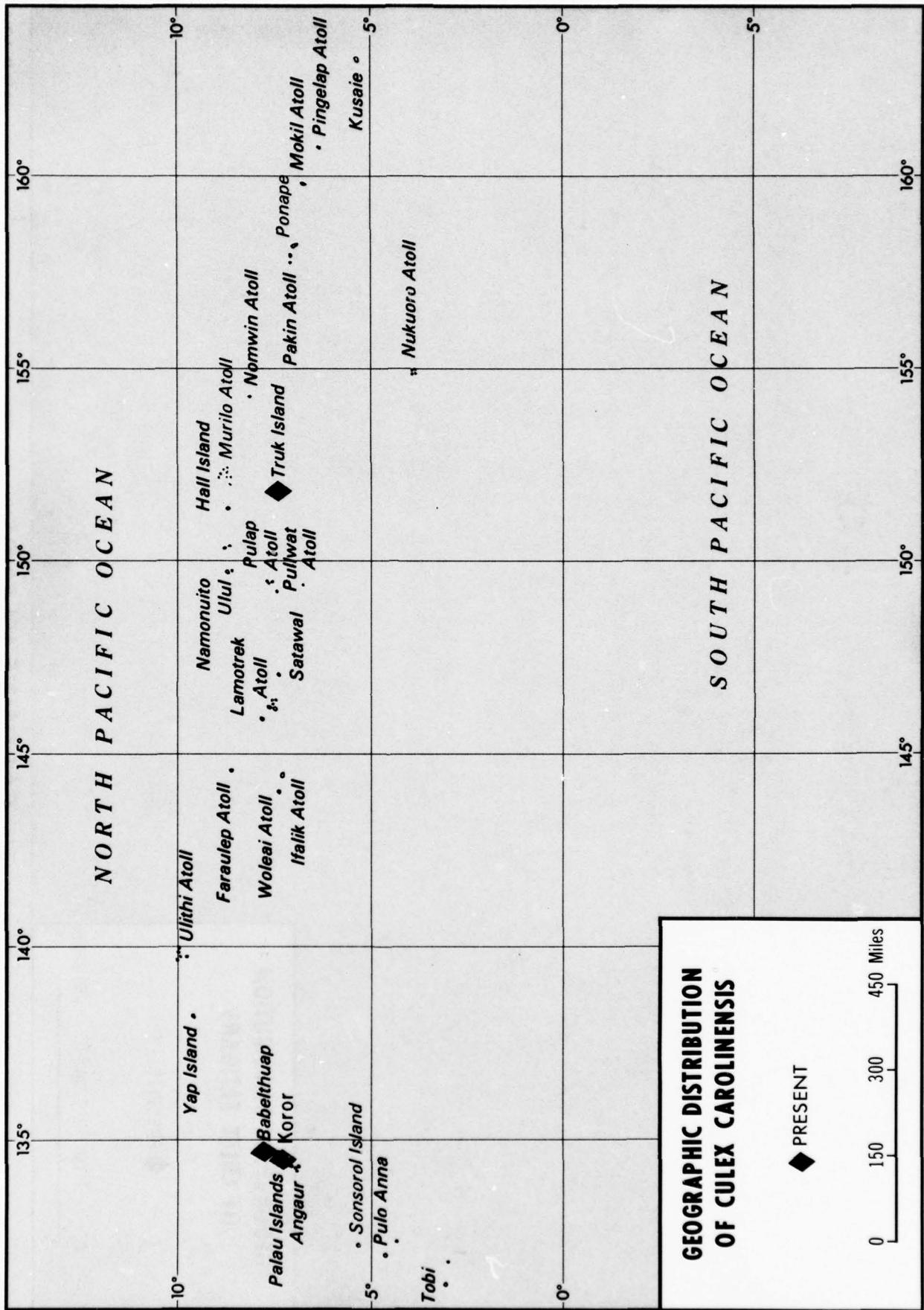
CAROLINE ISLANDS

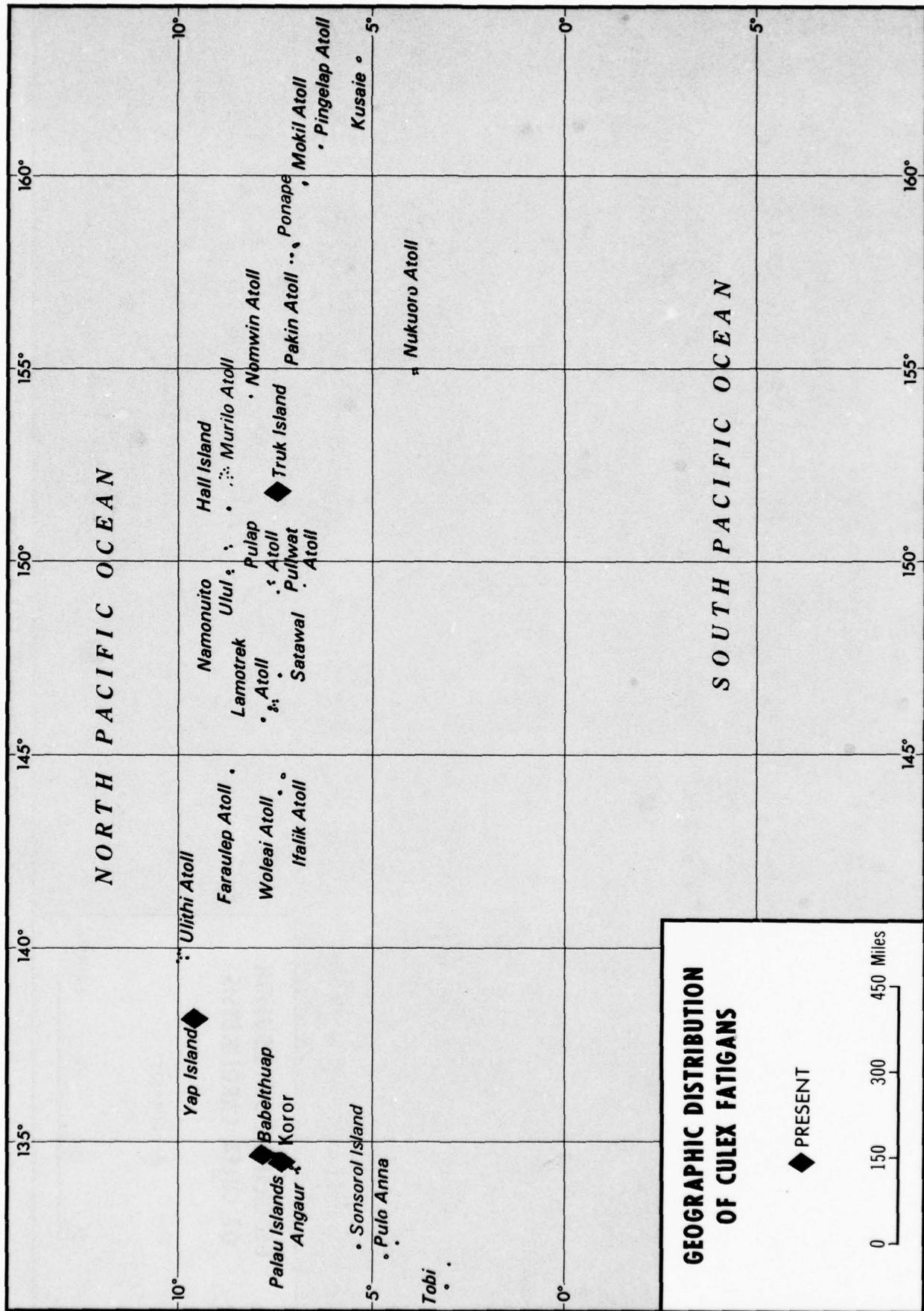


**GEOGRAPHIC DISTRIBUTION
OF *CULEX ANNULIROSTRIS***

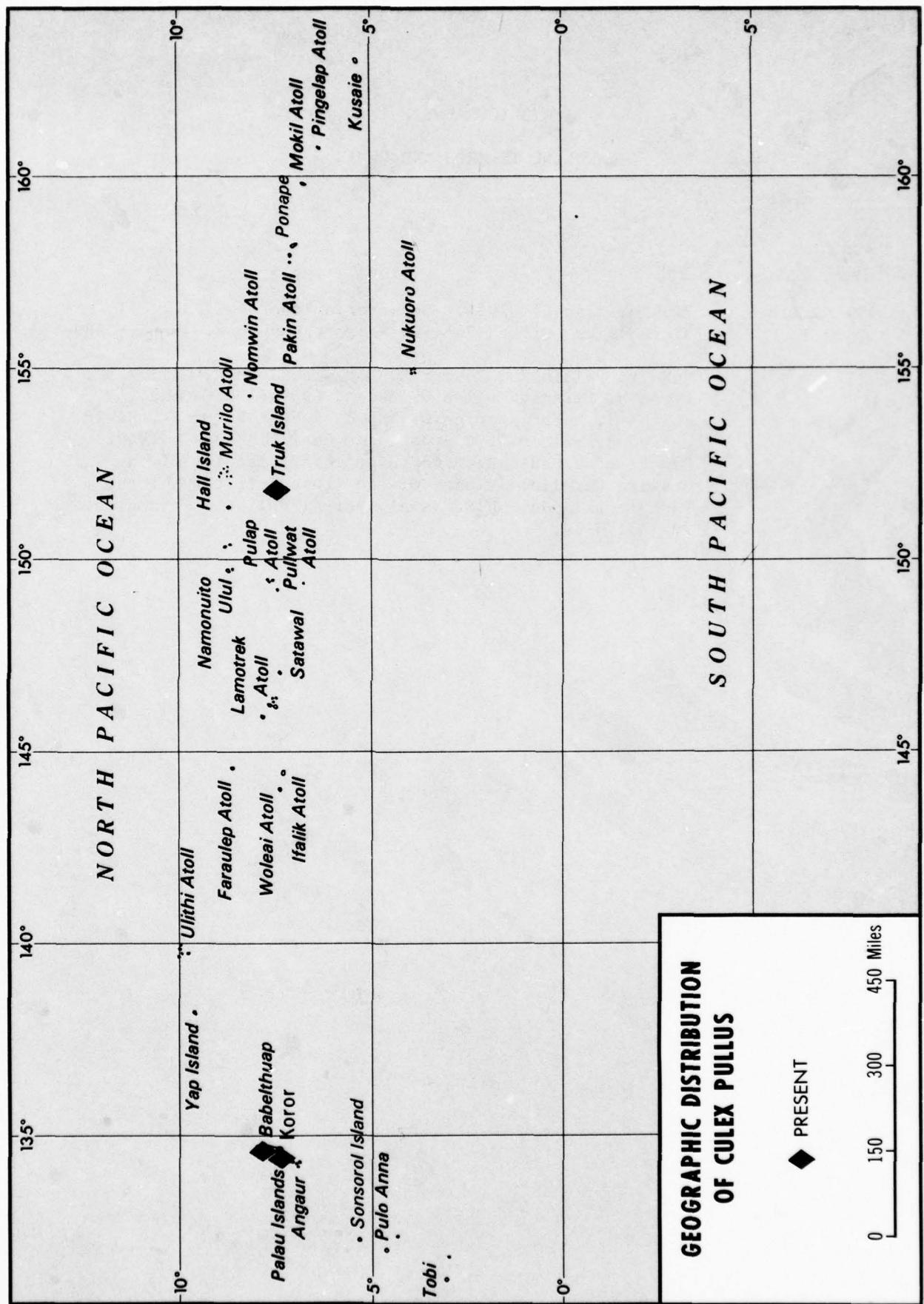
0 150 300 450 Miles

CAROLINE ISLANDS





CAROLINE ISLANDS



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2113	McNair, Philip K., Robert R. Garrison, John H. Gilip Jr., Byron M. Briggs, Lucien G. Estes, George M. Lanaze, Roland J. Hurst, George G. Appel, Robert V. Davis, David Delapena, Walter P. Claypool and Carl N. Hayes. 1949. Report of a medical survey of the YAP district of the Western Caroline Islands of the Trust Territory of the Pacific Islands. U.S. Naval Medical Bulletin - Supplement. 22 (4): 5-19.

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<u>Document Number</u>	<u>Source</u>
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2113	McNair, Philip K., Robert R. Garison, John H. Gilip Jr., Byron M. Briggs, Lucien G. Estes, George M. Lamaze, Roland J. Hurst, George G. Appel, Robert V. Davis, David Delapena, Walter P. Claypool and Carl N. Hayes. 1949. Report of a medical survey of the YAP district of the Western Caroline Islands of the Trust Territory of the Pacific Islands. U.S. Naval Medical Bulletin - Supplement. 22 (4): 5-19.

Q. Tubuai Islands

1. Human Data

There is no indication of mosquito control measures being introduced but treatment was started in 1962. The geographic distribution of the highest prevalence rates can be found in Map 196. The most recent prevalence rates are presented in Table 25.

2. Mosquito Data

There is no information on the mosquito population in the Disease Information System.

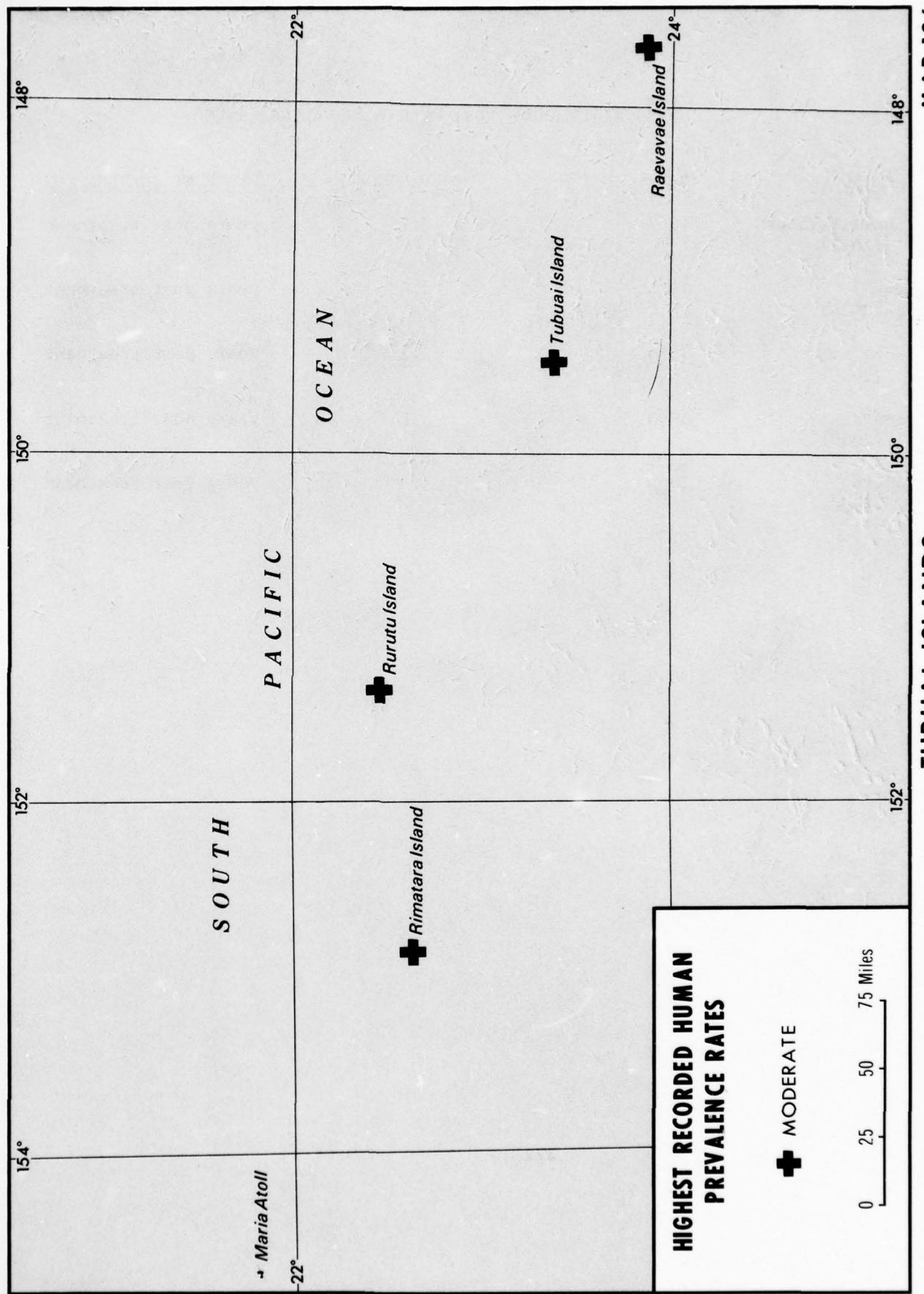


Table 25

TUBuai ISLANDS- MOST RECENT PREVALENCE RATED

<u>LOCATION</u>	<u>DATE</u>	<u>PREVALENCE</u>	<u>TREATMENT INFORMATION</u>
Tubuai Islands (2042)	1967	2.7%	5 years post treatment
Tubuai (2038)	1965	1.8	3 years post treatment
Raevavae (2038)	1965	2.1	3 years post treatment
Rimatara (2038)	1965	5.2	3 years post treatment
Rukutu (2038)	1964	4.9	2 years post treatment

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<u>Document Number</u>	<u>Source</u>
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2138	Unknown, 1969. Raw data - Tahiti and Tubuai Islands - filariasis. Unpublished. 1-24.

R. Mariana Islands

1. Human data

The only observation on human disease in the Disease Information System notes that no cases of human filariasis were reported on the island of Guam during 1970 and 1971.

2. Mosquito Data

Information on the role and the bionomics of the various mosquito species can be found in Table 26. All information is for the island of Guam.

Table 26
MARIANA ISLANDS — MOSQUITO DATA

	ROLE	HABITAT	BREEDING	BITING	REMARKS
<i>Aedesomyia catasticta</i>					source: 2078.
<i>Aedes aegypti</i>	dengue vector. (2078)		artificial containers. (2078)		additional source: 2111.
<i>Aedes albopictus</i>	dengue vector. (2078)	apparently prefers high organic content water. (2055)	shares same breeding sites with <i>Aedes guamensis</i> . natural containers -- tree holes, coconut shells, hollow logs, rock holes, bamboo, palm bracts, snail shells, artificial containers -- cans, barrels, bowls, pots, etc. in houses, tires. (2055)	rarely observed biting human bait. (2055)	replaced <i>Aedes aegypti</i> after its elimination. (2078) has apparently invaded most of Guam. (2055)
<i>Aedes dybasi</i>			artificial containers, <i>pandanus</i> axils, tire depressions, tree holes. (2078)		source: 2078.
<i>Aedes guamensis</i>		apparently prefers high organic content water. (2055)			rarely observed biting human bait. (2055)

Table 26 cont.

MARIANA ISLANDS — MOSQUITO DATA

	ROLE	HABITAT	BREEDING	BITING	REMARKS
<i>Aedes guamensis</i> (cont.)			bowls, pots, etc. in houses, tires. (2056) artificial containers, sluggish streams. (2078)		
<i>Aedes henseli</i>				source: 2078.	
<i>Aedes moanensis</i>		grassy ditch. (2039)			
<i>Aedes pandani</i>			artificial containers, grassy ditch, pandanus axis, standing water, tire depressions, tree holes. (2078)	only in pandanus leaf axis. (2111)	
<i>Aedes pseudoscutellaris</i>				larvae collected from water filled tree hollow and coconut shells. (2111)	
<i>Aedes rotanus</i>				grassy ditch, sluggish stream. (2078)	
<i>Aedes saipanensis</i>					source: 2078.
					226

Table 26 cont.

MARIANA ISLANDS — MOSQUITO DATA

	ROLE	HABITAT	BREEDING	BITING	REMARKS
<i>Aedes vexans</i>		artificial containers, carabao wallow, grassy ditch, sluggish stream, tire depressions. (2078)			
<i>Anopheles baezai</i>		carabao wallow. (2078)			
<i>Anopheles lesteri</i>		carabao wallow. (2078)			
<i>Anopheles sinensis</i>		primarily malaria vector. (2078)	carabao wallow. (2078)		
<i>Anopheles subpictus</i>			carabao wallow, hoof prints. (2078)		
<i>Anopheles tessellatus</i>		malaria vector in other areas. (2078)	carabao wallow. (2078)		
<i>Anopheles vagus</i>		variable malaria vector potential. (2078)	carabao wallow and hoof prints. (2078)		

Table 26 cont.

MARIANA ISLANDS — MOSQUITO DATA

	ROLE	HABITAT	BREEDING	BITING	REMARKS
<i>Culex fatigans</i>		hog wallow. (2111)	artificial containers, carabao wallow, grassy ditch, sluggish stream, standing water, tire depressions. (2078)		
<i>Culex fuscans</i>			artificial containers, carabao wallow, grassy ditch, sluggish stream, standing water. (2078)		
<i>Culex fuscoccephalus</i>			artificial containers, carabao wallow, grassy ditch, sluggish stream, standing water, hoof prints. (2078)		
<i>Culex hutchinsoni</i>				source: 2078.	
<i>Culex littoralis</i>				carabao wallow, standing water. (2078)	
<i>Culex papuensis</i>				source: 2078.	
					228

Table 26 cont.

MARIANA ISLANDS — MOSQUITO DATA

	ROLE	HABITAT	BREEDING	BITING	REMARKS
<i>Culex pseudovishnui</i>					source: 2078.
<i>Culex sitiens</i>			artificial containers, carabao wallow, grassy ditch, standing water. (2078)		
<i>Culex tritaeniorhynchus</i>	Japanese B encephalitis vector. (2078)		artificial containers, carabao wallow, grassy ditch, sluggish stream, standing water, tire depressions. (2078)		
<i>Culex vagans</i>					source: 2078.

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<u>Document Number</u>	<u>Source</u>
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2055

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2078

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2111

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S. Marshall Islands

1. Human data

The only observation in the Disease Information System is for Arno in 1950 in which no obvious disease was present.

2. Mosquito Data

Information on the role and the bionomics of the 3 mosquito species is presented in Table 27. All observations were from the island of Arno.

Table 27
MARSHALL ISLANDS — MOSQUITO DATA

	ROLE	HABITAT	BREEDING	BITING	REMARKS
<i>Aedes aegypti</i>			concrete cisterns and other drinking water receptacles. (2120)		larvae are bottom feeders. (2120)
<i>Aedes marshallensis</i>			tree holes and coconut shells. (2120)		
<i>Culex fatigans</i>					absent. (2120)

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Document
Number

2120

Source

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of Arno. Excerpts. Atoll Research Bulletin. #15-16.

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MARSHALL ISLANDS AND MOSQUITO

<u>Document Number</u>	<u>Source</u>
2120	Usinger, R. L. and Ira La Rivers. 1953. Insect life of Arno. Excerpts. Atoll Research Bulletin. #15-16.

T. Gilbert Islands

1. Human Data

Reportedly, only periodic *W. bancrofti* is present in this area. Transmission is by *Culex pipiens fatigans*.

2. Mosquito Data

Information on the role and the bionomics of the various mosquito species is presented in Table 23.

Table 28
GILBERT ISLANDS — MOSQUITO DATA

	ROLE	HABITAT	BREEDING	BITING	REMARKS
<i>Aedes aegypti</i>					source: 2080.
<i>Aedes marshallensis</i>		husks of coconuts. (2080)	shady area, daytime pests. (2080)		common everywhere on Tarawa. (2080)
<i>Aedes vexans</i>			coarse taro (babai) pits. (2080)		
<i>Culex annulirostris</i>				bothersome at night. (2080)	
<i>Culex fatigans</i>					source: 2080.

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GILBERT ISLANDS AND HUMAN

<u>Document Number</u>	<u>Source</u>
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2091	Schlosser, Ralph J. 1945. Observations on the incidence of <u>Wuchereria bancrofti</u> larvae in the native population of the Solomon Islands area. American Journal of Tropical Medicine. 25: 493-495.

U. Nauru Island

1. Human Data

The only observation in the Disease Information System on this island was a survey (1927-1932) in which the prevalence rate, as demonstrated by the thick film smear, was 36.1%, periodic type.

2. Mosquito Data

Limited information on the mosquitoes is presented in Table 29.

Table 29
NAURU ISLAND — MOSQUITO DATA

	ROLE	HABITAT	BREEDING	BITING	REMARKS
<i>Aedes</i> <i>argenteus</i>					source: 2115.
<i>Culex</i> <i>fatigans</i>	filarial embryos in crushed specimens suggests vector capability. (2115)				
<i>Stegomyia</i> <i>fasciata</i>					source: 2115.

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Document
Number Source

2115 Grant, Alan M. B. 1933. Medical survey of the island
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NAURU ISLAND AND MOSQUITO

<u>Document Number</u>	<u>Source</u>
2115	Grant, Alan M. B. 1933. Medical survey of the island of Nauru. Med. Jour. Aust. 1: 113-118.

V. Ocean Island

1. Human Data

The only observation in the Disease Information System was made in 1950; Banabans with periodic type filariasis were found not to have elephantiasis and chyluria was very rare.

2. Mosquito Data

Limited information on the mosquitoes is presented in Table 30.

Table 30
OCEAN ISLANDS — MOSQUITO DATA

	ROLE	HABITAT	BREEDING	BITING	REMARKS
<i>Aedes aegypti</i>		wells and caverns in porous rock. (2036)			
<i>Aedes scutellaris</i>				absent. (2036)	
<i>Culex fatigans</i>		wells and caverns in porous rock. (2036)			

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<u>Document Number</u>	<u>Source</u>
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<u>Document Number</u>	<u>Source</u>
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IV. INDEX

Mosquito Vectors of Wuchereria bancrofti

in the South Pacific

Aedeomyia	Table 26
catasticta	
Aedes	Tables: 3, 6, 8, 12, 14, 17, 18, 21, 24, 26, 27, 28, 30
aegypti	Maps: 7, 45, 59, 94.
Aedes	Table 23
albilabris	Map 79
Aedes	Table 23
albolineatus	Map 80
Aedes	Table 26
albopictus	
Aedes	Table 17
alterans	Map 60
Aedes	Table 29
argenteus	
Aedes	Tables: 10, 20
cooki	
Aedes	Table 26
dybasi	
Aedes	Table 8
edgaris	
Aedes	Table 2
fijiensis	Maps: 6, 18
Aedes	Table 14
finlaya	Map 53
Aedes	Table 21
funereus	
Aedes	Table 21
futumae	

<i>Aedes guamensis</i>	Table 26
<i>Aedes hebrides</i>	Table 21
<i>Aedes hensili</i>	Tables: 24, 26 Map 95
<i>Aedes horrescens</i>	Table 2
<i>Aedes imprimens</i>	Table 23 Map 81
<i>Aedes kermoganti</i>	Table 17
<i>Aedes kochi</i>	Tables: 23, 24 Map 96
<i>Aedes marshallensis</i>	Tables: 27, 28
<i>Aedes moenensis</i>	Tables: 24, 26 Map 97
<i>Aedes nocturnus</i>	Tables: 3, 14 Map 54
<i>Aedes noto-scriptus</i>	Table 17 Map 61
<i>Aedes oceanicus</i>	Tables: 3, 6, 14 Maps: 28, 55
<i>Aedes pandani</i>	Table 26
<i>Aedes polynesiensis</i>	Tables: 2, 3, 6, 8, 10, 12, 16, 18, 19 Maps: 4, 16, 25, 33, 38, 43, 57, 69, 71
<i>Aedes pseudo-scutellaris</i>	Tables: 2, 3, 6, 8, 10, 12, 16, 18, 24, 26, 30 Maps: 5, 17, 39, 44, 98

<i>Aedes rotanus</i>	Table 26
<i>Aedes rotumae</i>	Table 2
<i>Aedes saipanensis</i>	Table 26
<i>Aedes samoanus</i>	Table 6 Map: 26, 34
<i>Aedes scutellaris</i>	Tables: 14, 19, 20 Maps: 50, 72
<i>Aedes scuto-scriptus</i>	Table 24 Map 99
<i>Aedes suvae</i>	Table 2 Map 8
<i>Aedes tabu</i>	Table 14 Map 52
<i>Aedes tongae</i>	Tables: 10, 14 Map 51
<i>Aedes tongae-niue</i>	Table 20
<i>Aedes tutuile</i>	Tables: 3, 6 Map 29
<i>Aedes upolensis</i>	Tables: 3, 6 Maps: 27, 35
<i>Aedes variegatus</i>	Table 6
<i>Aedes vexans</i>	Tables: 2, 3, 6, 12, 17, 21, 26, 28 Maps: 9, 19, 62
<i>Aedes vigilax</i>	Tables: 2, 17 Maps: 10, 20, 46, 63
<i>Aedes zonapeg</i>	Table 24 Map 101
<i>Aedes zonatipes</i>	Table 24 Map 100

<i>Anopheles baezai</i>	Table 26
<i>Anopheles farauti</i>	Tables: 21, 23 Maps: 74, 76
<i>Anopheles gambiae</i>	Table 2
<i>Anopheles koliensis</i>	Table 23 Map 77
<i>Anopheles lesteri</i>	Table 26
<i>Anopheles punctulatus</i>	Table 23 Map 78
<i>Anopheles sinensis</i>	Table 26
<i>Anopheles subpictus</i>	Table 26
<i>Anopheles tesselatus</i>	Table 26
<i>Anopheles vagus</i>	Table 26
<i>Armigeres breinli</i>	Table 23 Map 83
<i>Culex annulirostris</i>	Tables: 2, 3, 6, 8, 10, 12, 14, 17, 18, 21, 23, 24, 28 Maps: 11, 21, 47, 64, 84, 102
<i>Culex atriceps</i>	Table 8
<i>Culex basicintus</i>	Table 17
<i>Culex carolinensis</i>	Table 24 Map 103
<i>Culex fatigans</i>	Tables: 2, 3, 6, 8, 10, 14, 16, 17, 18, 21, 23, 24, 26, 27, 28, 29, 30 Maps: 12, 22, 30, 40, 48, 65, 85, 104
<i>Culex fraudatrix</i>	Table 23 Map 86

<i>Culex fuscanus</i>	Table 26
<i>Culex fuscocephalus</i>	Table 26
<i>Culex halifaxi</i>	Table 23 Map 87
<i>Culex hilli</i>	Table 23 Map 88
<i>Culex hutchinsoni</i>	Table 26
<i>Culex litoralis</i>	Tables: 8, 26
<i>Culex pacificus</i>	Table 21
<i>Culex papuensis</i>	Table 26
<i>Culex pseudo-melanoconia</i>	Table 17
<i>Culex pseudo-vishnui</i>	Table 26
<i>Culex pullus</i>	Table 24 Map 105
<i>Culex sitiens</i>	Tables: 2, 3, 10, 17, 20, 21, 23, 26 Maps: 13, 23, 66, 89
<i>Culex tritaeniorhynchus</i>	Table 26
<i>Culex vagans</i>	Table 26
<i>Mansonia crassipes</i>	Table 17
<i>Mansonia uniformis</i>	Table 23 Map 90

<i>Stegomyia</i> <i>faciata</i>	Tables: 10, 29
<i>Taeniorrhynchus</i> <i>purpurata</i>	Table 2 Map 14
<i>Taeniorrhynchus</i> <i>xanthogaster</i>	Table 17 Map 67
<i>Tripteroides</i> <i>caledonia</i>	Table 17
<i>Tripteroides</i> <i>quasiornata</i>	Table 23 Map 91
<i>Tripteroides</i> <i>solomonis</i>	Table 23 Map 92
<i>Toxorhynchites</i> <i>brevipalpis</i>	Table 3

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